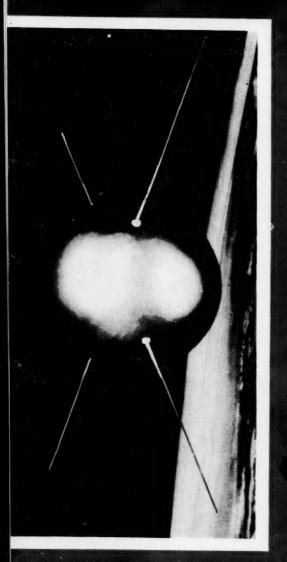
Chemical Week-



how much will they cut into U.S. chemical exports

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85-plant coment strike may be settled next week. At issue: company wide baygaining . p. 44

Chimical skowcase in space. CPI puls the boost into earth-satellite program

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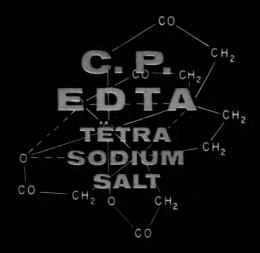
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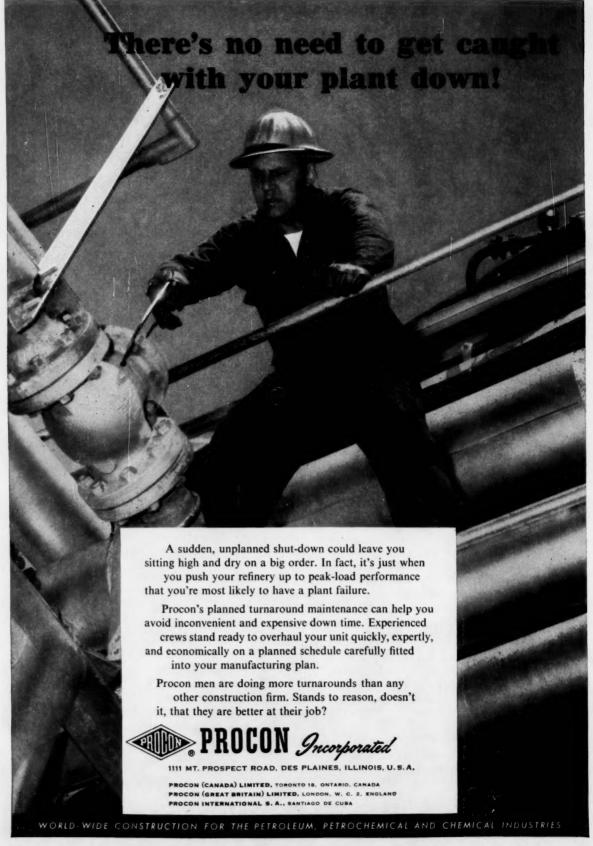
Market for flocculating agents grows as uranium processing takes an everbigger bite out of production.

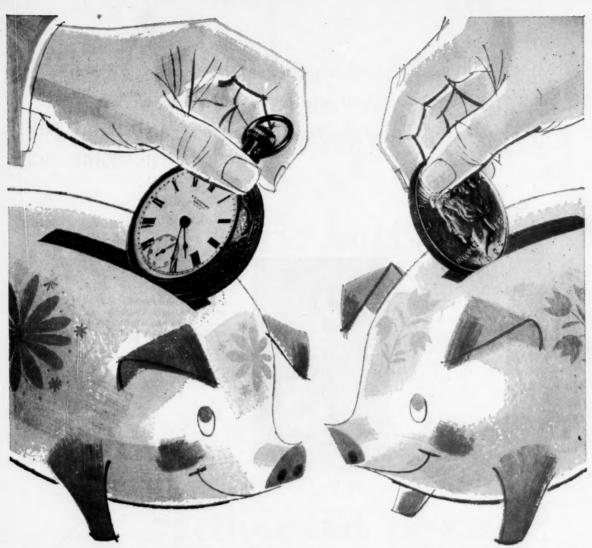
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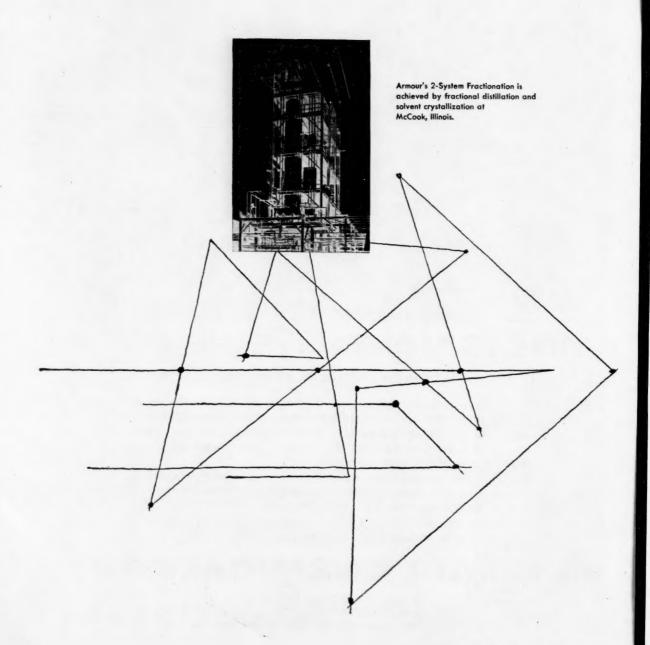
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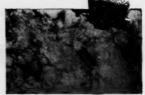
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OPINION

Professional Recognition

To THE EDITOR: From time to time during the past several years, [we all] have talked and written about various ways in which better recognition could come to members of the professions.

And yet, I am afraid that perhaps some of this talk is mere lip service, as witness the first paragraph in an article entitled, "New Twist in Polycarbonate Research," (June 1, p. 57). In that paragraph reference is made to certain patents "just issued to Eastman Kodak."

You and I and many others know that these patents were not issued to Eastman Kodak, but were issued to certain individuals who in turn... assigned them to Eastman. Don't you think it might be a little better if that statement read something like this: "just issued to John Doe and Richard Roe, who assigned them to Eastman Kodak"?

Individual or personal recognition in this manner will do much to help bring about the recognition of individual members of these professions of which you and I are justly proud.

W. A. CUNNINGHAM
Professor
The University of Texas
Department of Chemical Engineering
Austin, Tex.

Polypropylene in W. Va.?

TO THE EDITOR: With a certain surprise I read (July 6, p. 17) that Montecatini will definitely make polypropylene at a plant to be built in West Virginia, polymerizing propylene raw material purchased from Ashland Oil Co.

As representative of Montecatini in this country, I wish to say that it is

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N. Y.



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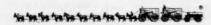
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OPINION

true that options have been taken on a site near Neal, W. Va., but no decisions have been made as yet on what to do on such site.

Many things have been said and printed on Montecatini's intentions to manufacture in this country. However, I wish to point out that no definite plans on raw materials, end products and site have been made by Montecatini up to date.

May I take this opportunity to mention that Spencer's urea plant at Vicksburg, Miss., indicated on p. 71 of the same issue, was also built using the Montecatini process.

> LUCIO LUCINI Chemore Corp. New York

A radiogram from our Rome Bureau says, "Montecatini's Milan headquarters officially confirms company currently 'studying possibility of erecting U.S. plant principally for production of new polypropylene plastic . . . Company also said will 'most probably' use raw materials supplied by Ashland Oil." - ED.

Wet Minnesota

TO THE EDITOR: Congratulations on your excellent article (June 29, p. 21) pointing up the ever-increasing shortage of process water. You also clearly tabulated the high cost of "creating" new water.

Why not complete the picture by indicating some of the locations with excellent water outlooks? In contrast to the bleak prospects painted for so many regions in your article, the Twin Cities area is blessed with a water supply that is probably the most abundant of any industrial area in the country. Not only are we in the "Land of 10,000 Lakes" but also our underground water is virtually unlimited. Each well in our area easily pumps at least 1 million gal./day of low-cost water at constant cold temperature (around 50 F) and possessing excellent chemical characteristics. Sufficient flow rates (1,000 gpm. or greater) are obtained from depths ranging from as little as 50 ft. up to 500 or 600 ft.

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OPINION

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DONALD H. THOMAS
Assistant Director
Industrial Development
The First National Bank of Saint Paul, Minn.

MEETINGS

Denver Research Institute, Metallurgy Division, 6th annual conference on industrial applications of X-ray analysis, Albany Hotel, Denver, Aug. 7-9.

American Institute of Chemical Engineers, and the American Society of Mechanical Engineers, 1st national conference on heat transfer, Pennsylvania State University, University Park, Pa., Aug. 12-15.

Northwestern University conference on liquid scintillation counting, Technological Institute, Evanston, Ill., Aug. 20-22.

American Soybean Assn. and National Soybean Processors Assn., annual meeting, Leamington Hotel, Minneapolis, Aug. 26-28.

Fisk University, 8th annual infrared spectroscopy institute, Nashville, Aug. 26-30.

Instrument Society of America, international symposium on gas chromatography, Kellogg Center for Continuing Education, East Lansing, Mich., Aug. 28-30.

National Agricultural Chemicals Assn., annual meeting, The Essex and Sussex, Spring Lake, N. J., Sept. 4-6.

Instrument Society of America, 12th annual instrument automation conference and exhibit, Auditorium, Cleveland, Sept. 9-13.

Technical Assn. of the Pulp and Paper Industry, testing conference, Hotel Shoreham, Washington, Sept. 11-13.

Chemical Market Research Assn. annual resort meeting; theme: impact of St. Lawrence Seaway on chemical industry; Lake Placid Club, Lake Placid, N.Y., Sept. 15-17.

International Union of Leather Chemists Societies, 5th conference, Rome, Italy, Sept. 15-20.

National Bureau of Standards, freeradicals symposium, Washington, Sept. 18-20.

Drug, Chemical and Allied Trades Section of the New York Board of Trade, 67th annual meeting, Galen Hall, Wernersville, Pa., Sept. 19-21.

American Oil Chemists' Society, fall meeting, Netherland Hilton Hotel, Cincinnati, Sept. 30-Oct. 2.



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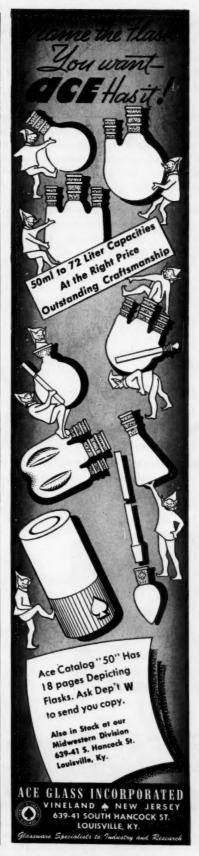
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Business Newsletter

CHEMICAL WEEK July 27, 1957 Union Carbide's reaction to charges that its acquisition of Visking was a violation of antimonopoly provisions of the Clayton Act is to the point: "A thorough study was made and the conclusion reached that this action was legal and proper."

Meanwhile, according to UCC President Morse Dial, "We will continue to carry out our plans and conduct our business in our normal fashion."

Carbide reports record sales for January-June '57. With a mark of \$640 million, 8% over the '56 sales, Carbide reached a new high, but was not able to produce a record high net—its net income this year of \$69.6 million was 4.5% below the \$72.8 million of the first half of '56.

Will Dow Chemical's plans to merge with Dobeckmun, the packaging-materials firm (CW Business Newsletter, June 22), be affected by the government's antimonopoly charges against the Carbide-Visking merger? That merger can't take place before stockholders' meetings of the two firms in late August, and until then, Dow prefers to make "no comment."

Simplifying pesticide regulations may eliminate some good ones, according to the National Agricultural Chemicals Assn.'s Lea Hitchner. He's referring in particular to a "wave" of state legislation specifying which pesticides may be sold and what formulations they may appear in. Hitchner expresses the industry's view that the federal Miller Amendment provides adequate protection to pesticide users; that more restrictive state legislation is unnecessary.

Atlas Powder has cancelled plans for an explosives plant in Tennessee, near Knoxville. The company had optioned about 1,200 acres in the area, now says it has "decided to abandon indefinitely all plans for expansion in the Knoxville area." Atlas just last week revealed plans to spend \$4 million modernizing its Joplin, Mo., nitric acid and ammonium nitrate facilities (see Technology Newsletter, p. 71).

Urethane paints for concrete have been worked out by Mobay Chemical Co. Mobay is now offering Mondur-Multron resins (polyester resins reacted with a poly-isocyanate) to paint formulators. The solvent-bearing paints are said to have far greater hardness, abrasion resistance and chemical resistance than conventional concrete coatings of equal thickness.

Davison is going ahead with plans for a sulfuric acid plant in Wyoming. It will build a \$2-million unit (200 tons/day) at Caspar

Business

Newsletter

(Continued)

(CW Business Newsletter, July 6). Due onstream in July '58, the plant will rely on recovered molten sulfur from northwest Wyoming for raw materials. Petroleum refineries and uranium mills in the region are figured to be main customers. The Davison plant is the second new sulfuric acid plant scheduled for Wyoming; Lucky Mc Uranium interests also plan one for the region (see p. 24).

Some more half-year financial reports on chemical firms are

- Pennsalt Chemicals had a net profit for the half year of \$1.96 million, on sales of \$40.8 million. The sales gain was almost 10%, but per-share profit dropped about 11% (to \$1.53/share in '57, from \$1.73/share).
- Catalin Corp. net profit zoomed 30% for this half year over the comparable period in '56, up to \$236,698, from \$182,632. Per-share earnings jumped from 16ϕ in Jan.-June '56, up to 22ϕ so far this year. Sales this year now total \$12.2 million.
- Pan American Sulphur Co. netted \$1.6 million, 120% over first-half '56's \$699,893. Share earnings went up to 82¢, from 35¢. Shipments in the half-year period were valued at \$7.5 million.
- Eli Lilly & Co. sold \$100.5 million worth of pharmaceuticals in the first six months of '57, a figure 11% over the first-half '56 total of \$90 million. Net in '57 is \$17.7 million (it was \$16.5 in the same period last year). Earnings are about \$2.23/share, were \$2.11/share last year.

A seven-year report from the General Services Administration shows stockpilers have made money on natural rubber, lost on metals and minerals, in operations since 1950. The rubber stockpile showed a net profit (from sale of stockpile rubber to industry for rotation and upgrading) of \$13.9 million. But over-all, the security stockpile showed a loss of \$163 million—of which \$101 million was in minerals and metals programs.

Half-yearly report on Britain's trade shows value of imports exceeded exports by a wider margin this year than it did in '56. Total exports were valued at \$5,217.6 million, imports at \$5,880.9 million. The differential, \$963.2 million, is nearly 13% more than last year's differential, \$855.1 million. Board of Trade officials blame the trade gap partly on the Suez crisis—delayed arrivals of shipments ordered in '56.

Dow will start construction of its new acrylonitrile plant at Freeport, Tex., early next year (CW, July 20, p. 94). The plant is due onstream in the first quarter of 1959. Basic starting material will be acetylene, not ethylene, and output is slated for Dow's production of synthetic fibers, plastics and flocculants.



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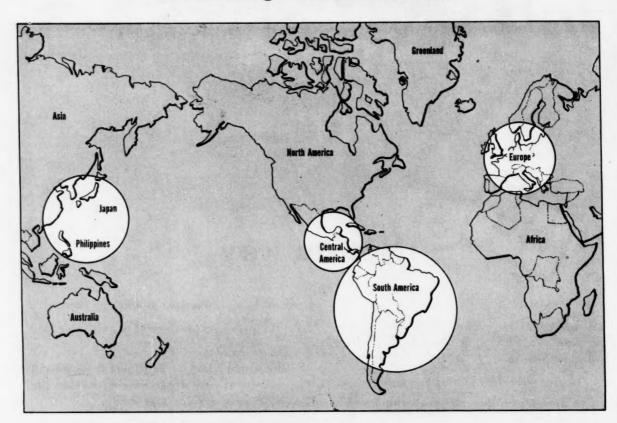
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The Coming Common Markets



Worldwide Squeeze on U.S. Chemical?

The European common market, which this week is awaiting the approval of the French Council of the Republic, is but the first and most apparent of similar schemes shaping up throughout the world. Others:

- A Central American common market excluding Mexico. Countries involved last year alone imported \$180 million worth of American materials.
- A South American common market, including Argentina and Brazil, which together imported \$112 million worth of chemically processed materials.
- A Far Eastern common market that would take in Japan and the Philippines. These countries bought a total \$180 million worth of chemical materials from U. S. firms in 1956.

Not Unanimous: Not everyone, of course, is agreed on what the development of these huge geographical bargaining units portend for the U. S. The State Dept. is said to be unequivocally in favor of them, because —in the long run—they should improve the well-being of free nations participating in them.

Some economists, however, point out that the lowering of trade barriers between participating members would tend to promote trade among them at the expense of outsiders. This, in turn, would make it even more difficult for nonparticipants to create and broaden markets in participating countries.

Chemical process management is largely apathetic to the unfolding common markets. Typical comment: "The European common market will take anywhere from 12 to 17 years to come to fruition, and the others are probably even further away. Why should we worry about them now?"

It's true, of course, that there's many a hedge to clear before ECM becomes effective, and the markets proposed for the Latin American states and the Far Eastern countries are still in the preliminary talking stage. But a few years aren't a very long time when you consider how long it takes for a chemical product to reach commercial stature (usually estimated at between five and seven years), plus the additional period needed to raise capital, build a plant and develop markets. Many chemical firms right now are working on new products that will

be ready for commercialization about the same time that the first impact of the cooperative markets would be felt.

Defining Markets: What are the countries considering banding together? In Europe, of course, the six common-market nations are Holland, Belgium, Luxembourg, France, West Germany and Italy. Thus far, the French Assembly has voted the nation's membership; the Council of the Republic has still to okay that decision. The only other member nation that has taken a vote on the issue is the West German Bundestag; the Bundesrat has held off its approval until the result of the French vote is in.

Together these six nations last year imported \$346,587,569 worth of U. S. processed chemical materials, including naval stores, gums, resins, paper and related products, petroleum products, stone, glass and clay products, coal tar products, medicinal and pharmaceutical preparations, chemical specialties, industrial chemicals, pigments, paints and varnishes, fertilizers and fertilizer materials, black powder and dynamite, and soap and toilet preparations.

Leading the list was France, which bought about \$88 million worth of products last year, with the Netherlands in second place with \$72 million worth of purchases. Italy was last with \$54 million.

Perhaps not so well known, but increasing in stature as a possibility, is the giant free-trade area proposed by Great Britain and including Denmark, Norway, Sweden, Switzerland and Austria. These nations comprised a \$215-million market for U. S. chemical processors in 1956. Together with the ECM countries, these nations comprised a 1956 market of \$562 million for U. S. chemicals. And, according to a number of observers, the combination of these countries into a huge free-trade area is not outside the realm of possibility.

Other Areas: In the Latin American countries there are two plans afoot to combine for trading purposes. The older of these two schemes is the Central American market made up of the states of, Guatamala, El Salvador, Honduras, Nicaragua, Costa Rica and Panama. These nations last year bought about \$80 million worth of chemical materials from U. S. makers.

The other plan is a South American union involving major countries of

South America. These nations last year purchased \$236 million worth of U. S. chemicals.

Chances for the realization of these two bargaining areas are considerably dimmer than those for the alreadyrolling European unit. They are not so dim, however, that they should be discounted.

Many economists viewing the South American situation feel that trade barriers between those countries are so strong that a common market would be virtually impossible. But since the war, South and Central America has been feeling the bite of African competition for European markets. Thus, some observers insist, increased pressure from Africa because of the inclusion of European-colonized countries in common-market agreements, may force the South American barriers down more quickly than has been predicted.

Asian Plan: In the Far East such countries as Vietnam, Burma, and Thailand have expressed interest in joining a common economic unit now being pressed for by Japan. This area would most probably include those nations plus Indonesia, Philippines, Korea and Japan. Together they constituted a U. S. chemical process market in 1956 of \$243 million.

Outlook: Upshot of all these schemes, of course, could be the eventual discouragement of U. S. chemical selling in these lucrative foreign areas. But nobody's going to be concerned that it will mean a complete loss of trade for American companies.

In essence, the projected markets will likely force U. S. chemical firms to produce more and more within the borders of these common areas. Producing and selling as a part of the market area, they'll be able to take advantage of benefits accruing to producers in common-market nations.

Already this is generally the case with American products sold abroad. A recent estimate by Edward Higgins, assistant general manager of U. S. Rubber's international division, indicates that of the \$55 billion worth of U. S. goods sold abroad, \$93 billion worth—or 76%—was manufactured abroad. And if the common markets proposed by these other nations come to full flower, it can be expected that this figure will be greatly increased, with the chemical process industry a leader in the movement.

U. S. Process Firms Sold These Areas \$1.2 Billion Worth of Goods in 1956



Far East: \$243 million



Central America: \$272 million



South America: \$326 million



Europe: \$347 million

EWING GALLOWAY





Bengert, Towe: Over-the-counter sales would fill a gap.

Making the Most of a Merger

Why is American Cyanamid now courting Norwich Pharmacal so assiduously (CW Business Newsletter, July 20)? Two reasons: Norwich has a solid background in over-the-counter drugs; it is also research-minded, has come up with an exclusive line of antimicrobial nitrofuran drugs.

Should the proposed merger come off—and negotiations are still in progress—Norwich's proprietary products would fill a gap in Cyanamid's line of pharmaceuticals.

Cyanamid is generally assumed to be one of the top four producers of biological products, medicinals, alkaloids, vitamins, and ethical preparations for both human and veterinary use. Its Lederle Laboratories Division last year provided about 25% of Cyanamid's total sales dollars—more than was contributed by any other single group of the company.

For Norwich, the gain isn't as readily apparent. Norwich wasn't seeking merger opportunities, according to President George Bengert; Cyanamid made the overtures.

Norwich's line of nonprescription remedies—including such well-known products as Pepto Bismol and Unguentine, as well as cough syrups, aspirin tablets and the like — has made steadily increasing sales. Although Bengert won't give a precise breakdown, it's plain that Norwich proprietaries bring in more sales dol-

lars than do its ethicals, most of which are sold under the Eaton Laboratories label.

The Eaton Lab products set new sales records last year, however. Furadantin, its nitrofuran compound for treating genitourinary ailments, was top seller. Cyanamid could possibly contribute to further development of the nitrofurans. Cyanamid is doing considerable research, says President Kenneth Towe, on combinations of various antibiotics. Nitrofuran-antibiotic combinations might prove to be a fruitful area of study.

Three for four: Early discussions between the firms indicate that a merger would likely be on the basis of three Cyanamid shares for four Norwich shares (Cyanamid stock is currently selling for about \$46/share; Norwich for \$35/share). Also, the preliminary plans specify Norwich's operation as a subsidiary rather than as a division (as Lederle is operated). Norwich's staff would be retained intact under such an arrangement. But detailed agreement has not yet been reached, and directors have not yet voted on the measure.

However the final merger plans shape up, the Cyanamid-Norwich combination would create a firm strong in virtually all phases of drug manufacture and sales. It looms as a powerful force in the increasingly competitive pharmaceutical industry.

Cellulose Shutdown

Last week's disclosure that Rayonier Inc., would shut down its Shelton, Wash., cellulose plant stemmed largely from the decline in demand for the types of chemical cellulose produced by the plant, Rayonier's oldest such unit.

But other factors enter the picture, too. Carrying great weight is the pollution of oyster beds in the Puget Sount area. Oyster growers of the area insist that discharges from the Shelton plant are responsible for killing off their oyster beds. (Studies are currently under way to determine the facts in the case.)

Model Plant: The Shelton plant long has been cited as an almost model plant as regards pollution control. Most of the sulfite liquor, which causes pollution, is recovered, converted into a solid and burned. The recovery plant cost more than \$1 million several years ago, and an additional \$7 million has been invested in control operation during the past few years.

However, Rayonier is able to recover only 97% of the waste liquor, and the remaining 3%, absorbed in the wood chips and considerably diluted in the bleaching process, is discharged. If Rayonier were to modernize its plant (at a cost of about \$1 million) to produce an upgraded pulp, the pollution problem would be increased, since the new process would require more bleaching and result in a greater volume of discharge. Rayonier doesn't know what investment would be required to control pollution under the new process, and is understandably reluctant to commit itself to an expensive program in the face of its present difficulties.

Rayonier is not committed to a permanent shutdown of the plant, however. Winston Scott, manager at Shelton, says that about 385 employees will be laid off, but a portion of its engineering staff will continue to work on projects to qualify the Shelton division for a five-year permit from the Washington State Pollution Control Commission. The plant presently is operating under a temporary permit scheduled to expire Aug. 28.

Anticipating that the long-term demand for chemical cellulose will grow, Rayonier will keep the Shelton mill in stand-by condition, Scott says.

Joint Action on Smog

The part chemical plants in the vicinity of Ashtabula, O., play in polluting the region's atmosphere may well be more clearly defined, now that city and county officials have decided to form a joint committee to analyze the pollution situation.

For more than a year, disgruntled residents of the city's northeast side have charged that pollution-caused smog has been withering foliage, damaging houses and automobile paint, causing sore throats and smarting eyes, and generally leaving a noxious smell.

Until now, city officials have felt their office lacked jurisdiction—since the chemical plants blamed for the condition are located outside of the city, along Lake Erie in Ashtabula Township. Now, the Ashtabula County Board of Health, which has wider jurisdiction, has agreed to join with the city in filing a joint request for state and federal aid on a study of the air pollution problem. The Ohio Dept. of Health and the U. S. Public Health Service will conduct the preliminary survey.

New Gas for the West

More supplies for natural-gasstarved areas of California are in prospect with announcement last week that a \$330-million, 1,300-mile pipeline system will connect California and the gas fields of Alberta, Canada,

The plans were announced by the Pacific Gas & Electric Co., a Canadian subsidiary of which has contracted for the purchase of substantial quantity of gas from the Canadian Western Natural Gas Co., Ltd., and Northwestern Utilities, Ltd. Both are gasdistributing utilities in Alberta.

Norman Sutherland, president of PG&E, notes that if the line is approved by the various federal and state regulatory authorities, "the markets provided by it will induce substantial investment of additional capital for exploration and development . . . in the field of petroleum byproducts."

The line will cross several mountain ranges, traversing portions of British Columbia, Idaho, Washington, Oregon and northern California, terminating at an existing PG&E transmission network station at Antioch, Calif.



JUDGE SMITH: In his decision, a victory for both sides.

Damage Suit Dropped

In a decision hailed as a victory by both sides, a U. S. district court judge last week dismissed a damage claim for triple damages brought in an antitrust suit by Farbenfabriken Bayer AG, against Sterling Drug.

At the same time, Judge Wm. F. Smith sustained Bayer's cause of action seeking to enjoin Sterling from impeding Bayer's re-entry into this country.

Paradox: Both companies immediately called the decision a victory. Sterling felt it had gained ground since the damage suit was dismissed and because Judge Smith termed "meritorious" Sterling's contention that Bayer's complaint should be dismissed because it fails "to state a claim upon which relief can be granted."

Bayer claims its objective is a step closer because the judge sustained its cause of action and because he denied Sterling's motion to stop Bayer from taking depositions in the case.

Bayer also feels jubilant because the claim for damages was dismissed on grounds that the statute of limitations had run out. The court gave Bayer an opportunity, however, to amend the complaint to show possible damage in years still covered by statute.

The decision is one of many resulting from efforts by Bayer to regain markets it lost to seizure by the U.S. Government in World War II. More controversy over food-additives legislation was sparked last week by charges that the chemical industry had brought pressure on government groups to cease research on cancer-producing chemicals.

The charges were brought during testimony in favor of food-additives legislation introduced by Rep. James Delaney (D., N. Y.) that would totally ban any carcinogenic chemicals from use as food additives. The testimony was offered by physician William Smith, whose experience in the field stems from work at Harvard Medical School, Sloan-Kettering Institute and New York University.

Specifically, Smith said that Dr. Wilhelm Heuper, a former director of the National Cancer Institute, had been fired from his job with Du Pont in 1937 for reporting that β Naphthalene had produced tumors in the bladders of dogs. Du Pont, in reply, points out that Heuper was let go for inability to get along with his colleagues, that the paper was published with the firm's blessings.

Congressman John B. Winters (D., Mo.) says he plans to leave the record open for further testimony on the matter of industry pressure.

Mich. Moves Seaward

Latest word on Michigan Chemical's proposed new sea-water to magnesium oxide plant is that it will produce refractory-grade material, according to President Ted Marvin.

The company's board of directors recently authorized final engineering studies for the plant's design, capacity of which reportedly will be close to 150 tons/day of oxide. Marvin says that company engineers have been surveying sites for some six months in an effort to find a suitable location, haven't yet settled on a site.

A likely spot, however, is Mobile, Ala., even though best markets for the material are in the East and Northeast. Sites from Brownsville, Texas, all the way to Alabama have been surveyed. Word following on the heels of the survey team sets the cost of the plant at between \$4 million and \$5 million, though Marvin points out that final costs and capacity won't be known until engineering studies are finished.

EXPANSION

Sulfuric Acid: Platte Chemical Co. (Salt Lake City) will construct a \$2.5-million sulfuric acid plant in Casper, Wyo. The plant will produce 225 tons/day of sulfuric for use in processing uranium ore in the nearby Gas Hills area. Pacific Power & Light Co. says that Davison Chemical Co. has also been given firm power commitments for a future sulfuric acid plant in the area (CW Business Newsletter, July 6). Sulfuric acid is now being shipped in from Denver.

Uranium: Wyoming's Gas Hills area (see above) is also increasing uranium production. Lucky Mc Uranium Corp. and Phelps-Dodge Corp. will jointly build a 1,000-ton/day addition to Lucky Mc's 750-tons/day uranium mill there. Phelps-Dodge will receive a 30% interest in the new portion.

Allylamines: Shell Chemical Corp. will build a unit to produce allylamines at its Martinez, Calif., plant. The unit, to produce mono-, di-, and triallylamines, will be in addition to a pilot plant that Shell has operated since the '40s. Details of cost and capacity are not revealed.

Aluminum: Alcoa will expand its Wenatchee, Wash., aluminum-reduction plant by addition of a fifth potline. Cost: \$10 million. The expansion follows a power supply agreement with Chelan County, Wash., for electricity from the Rocky Reach hydroelectric project.

Phosphates: The Bear Creek Mining Co., a subsidiary of Kennecott Copper Co., has leased 60,000 acres of bottomlands in Beaufort and Hyde Counties, N.C. The company will conduct explorations to determine if quantities of available phosphates warrant the building of a proposed \$25-million processing plant.

Petrochemicals: Monsanto's plastics division has begun two-major expansions of its Texas City petrochemical facilities. A 40-million lbs./year increase of the styrene monomer plant is slated for completion by June, 1958 and a 12-million lbs./year increase of acetylene capacity is due onstream early next year.

FOREIGN

Carbon Black/Australia: Godfrey L. Cabot, Inc. (Boston), and the United Carbon Co. (Charleston, W. Va.) will build a \$4.5-million carbon black plant in a Melbourne suburb. When completed the plant will be producing between 25 million and 30 million lbs. of carbon black a year—about half of Australia's current requirements.

Petrochemicals/Germany: British Petroleum Co.'s German affiliate, BP Benzin-Und Petroleum, will form a jointly owned company with Farbenfabriken Bayer (Leverkusen) to manufacture petrochemicals. Production units will be located adjacent to Bayer's Dormagen plant, near Cologne. They'll use about 300,000 tons a year of petroleum feedstocks supplied by a new BP refinery to be built in the Ruhr area. Total cost: \$53.4 million.

Caustic/Brazil: W. R. Grace & Co. has blueprinted several plants as part of a \$20-million expansion program in Brazil. Included: a caustic soda plant and a unit to produce detergents, DDT, cellulose and other products. Probable location: either in the northeast or southern regions.

Grace has asked the Pernambuco state development commission (northeastern Brazil) for details of the state's economy and for possible "encouragements" given to new industry. The company made similar inquiries in the southern state of Rio Grande do Sul.

Plastics/Australia: Union Carbide Corp. has merged its limited Australian interests (principally the manufacture of Eveready batteries) with Timbrol Ltd., of Sydney, Australia. The new enterprise will now begin a big expansion of Timbrol's already-extensive chemical manufacturing business, and move into the plastics field. Existing export markets of Timbrol will be retained and expanded whenever possible.

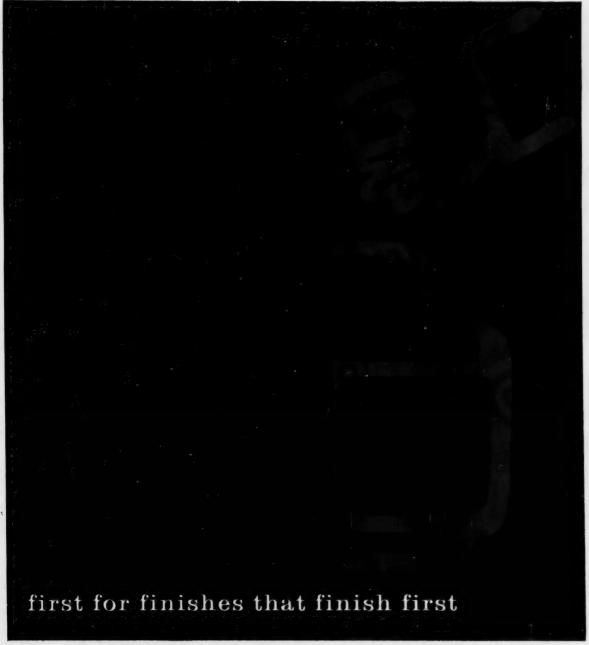
COMPANIES

International Glass Corp. (Culver City, Calif.) and Cascade Research Corp. (Los Gatos, Calif.) directors have agreed on terms to merge the two firms. The agreement calls for International to exchange 2½ shares of its common stock for each of Cascade's 33,953 outstanding Class A shares and one International share for each 3½ shares of Cascade Class B common.

The two firms plan to combine operations in a plant to be built on a newly acquired 17-acre site in Campbell, Calif. Provided stockholders of both companies approve the merger, construction on the new plant will get under way in September.

The Du Pont Co., through a wholly owned subsidiary, The Renappi Corp., has made a \$2-million investment in Texas oil fields. The company bought the holdings of Fred Whitaker and J. C. Trahan in the East Texas field. Whitaker and Trahan sold 20 units in the Carthage Bethany field of Panola County, and two units in the South Hallsville pool of Harrison County.

Flintkote Co. and Kosmos Portland Cement Co. (Louisville) will merge, subject to stockholder approval. Flintkote will issue 189,000 shares of common stock and 73,000 shares of 4½% second convertible \$100 par value for all Kosmos' outstanding shares. Kosmos will be operated as a wholly owned subsidiary.



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PRODUCTION





PHOTOS-IVAN MASSAR

Grim Realism Toughens Disaster Crews

Few companies, in drilling their fire and emergency crews, would add such realistic touches as the use of raw meat to simulate mutilation.

For plants in the Texas City area, such grimness may be superfluous. But to officials of Union Carbide Chemicals Co.'s Texas City plant, who this week are evaluating such a test (pictures), the added impact was worth the additional effort.

From 9 a.m. when Harry Felter, foreman in the Vinylite area, turned in the fire alarm at building 122, signaling an "explosion and fire" resulting from the rupture of solvent vessels

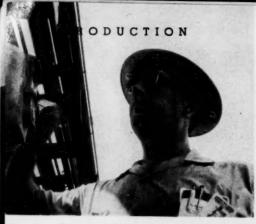
and lines, things moved swiftly—and for the most part, efficiently.

In one minute, rescue and fire trucks had arrived at the scene. Within three minutes, N. J. Welch, who is general foreman for the entire plant, also fire chief and in charge of disaster control, took command. He used a portable radio for sending out orders, quickly determined that the fire was too large to handle, called out remaining 50% of Carbide's fireand rescue-personnel.

The medical department, informed that there was an undetermined number of injured, alerted the Texas City Industrial Mutual Aid System through the Texas City police dept. by announcing: "IMAS: 'Green Cross' alert at Carbide. We request two doctors and four nurses at our Gate 1."

(The "Green Cross" alert dispatches aid as requested. Later, Welch changed it to "Grand Camp" alert, requested Texas City fire dept. to provide a pumper, asked IMAS to supply additional fire-fighting supplies—hose, foam powder, foam nozzles.)

To further test the mutual aid system, about midway through the drill, a "'fire' of undetermined origin" was found, as planned, in the dock



Foreman Felter turns in fire alarm.



Road blocks are set up by Texas City police in response to alarm.



Welch uses radio to marshal plant forces.



Rescue worker checks fire area for victims.

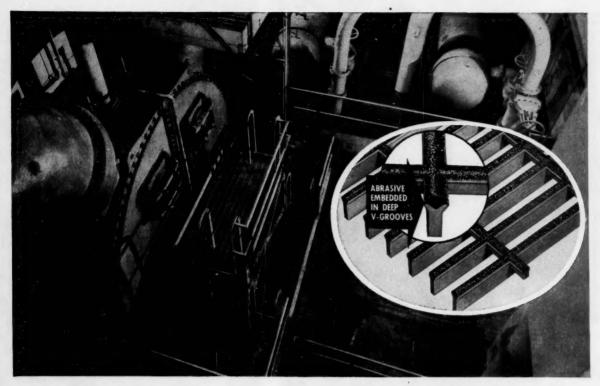


area of the Texas City Terminal Railway Co. property. TCT called in a "Red Ball" alert to the fire dept. The fire was found to be out of control and U.S. Coast Guard aid was called.

Critique: That afternoon, when the drill was discussed for the first time, it was brought out that the rescue people needed more training. (Specifically, the injured were not protected from the sun and heat while at the emergency dispensary on the parking lot.) But otherwise, the drill was well handled.

Only other slip-up was a failure in

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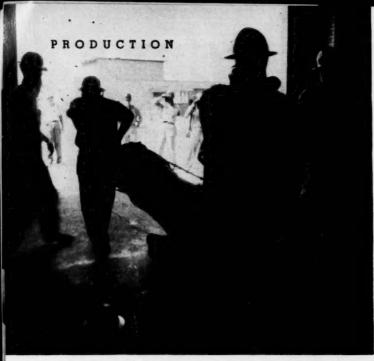
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Cameramen (background) record all phases of operations.





Upper lip of "victim" gets full cosmetic treatment as injured group is made up before drill starts.

outside communications, causing delay in arrival of medical assistance and fire-fighting supplies.

The Larger Picture: How well was the drill carried out? As in any situation such as this, there never will be a truly definitive answer. Carbide management, even before completion of a detailed analysis of the data, feels it was well worth the time and effort.

Said T. A. Wilker, Carbide plant superintendent: "The drill was very successful, especially in view of the fact we did not have much opportunity to practice. The success probably reflects our day-to-day procedures."

To enable others to profit from the drill, sound motion pictures were taken by signal corps photographers who were sent to Texas City by the Fourth Army. An army photographic makeup specialist supervised the preparation of the injured "victims." (The victims, in turn, acted with a realism seldom found in such films, showing not the slightest recognition of rescue workers. One casualty even put on an act of delirium.)

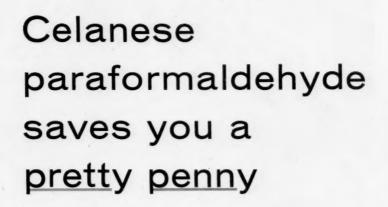
The films found first use on Wednesday of last week when Carbide officials and Mutual Aid System observers conducted a critical review of the proceedings. The films also will be used to train emergency personnel at plants of other members of the Texas City Industrial Mutual Aid System. Prints of the film will later be made available to any industrial group that would want to use them in conjunc-

tion with the training of emergency teams,

As summed up by Col. George Painter, chief of the Fourth Army's industrial defense division, "It was a very realistic drill. It will pay heavy dividends in any plant, in the event of a disaster, to have had drills of this type."

To rank-and-file members of Carbide's emergency squad, there was no question that because of its shock value, the drill would be remembered long after any less realistic exercise.

And to management—which, of course, has a direct interest in minimizing plant damage and in protecting workers—the value of a realistic drill such as this one isn't likely to be underestimated.



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NEW INSTALLATIONS

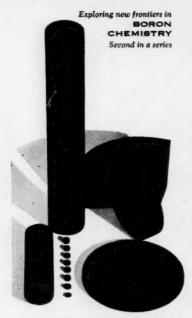
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MARKET DEVELOPMENT DEPARTMENT



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PRODUCTION

EQUIPMENT

Density Gauges: Two firms are out with new instruments for measuring density of liquids.

• The Ohmart Corp. (Cincinnati) has introduced its model LSG, a gauge with external measuring components, featuring a lead-shielded radioactive source. The unit measures percent solids in addition to density. Its operation is unaffected by changes in temperature, pressure, viscosity. Model LSG may be used on pipes 3 in. or larger.

• Precision Thermometer & Instrument Co. (Philadelphia) offers Princo 745, a direct-indicating model that features a zero-set adjustment for original calibration under working conditions and an adjustment for a temperature-corrected specific gravity reading. The instrument can be used for temperatures to 220 C, pressures to 125 psi. The body is of Pyrex pipe, inlet and outlet fittings are of 316 stainless steel or Hastelloy B or C. Standard connections: ½-in. female NPT. A bimetallic dial thermometer is included.

Weatherproof Housing: A new line of cast-aluminum weatherproof housings for instruments, etc., that features glass windows in the housing covers for easy inspection of the interiors, is being introduced by Adalet Manufacturing Co. (Cleveland). Gasketing makes the window-housing seal weathertight. Plastic windows can be supplied if desired.

Polyethylene Hopper-Filter: For filtering corrosive slurries such as hypochlorites, fluorides, caustics, American Agile Corp. (Cleveland) recommends its new polyethylene hopper. It is 42 in. high, with 24-in. conical lower section. Diameter across the top is 24 ¾ in. The portion above the cone is ½ in. thick, cone is ¼ in. thick. Filter plate is 1 in. thick, has ¼-in.-diameter holes on 1 in. centers. Cone portion is fitted with 13½-in.-diameter flange for connection to existing equipment.

Rupture Disk: Delanium Graphite Co. (Elizabeth, N. J.), distributor for Powell Duffryn Carbon Products Ltd. (England), is now offering graphite rupture for pressure vessels. Disks are mounted in a special carbon holder, are easily replaced. Sizes: two to six in. Operating pressures can be maintained for an indefinite period of time at pressures up to 75% of rated pressure. Accuracy: $\pm 5\%$ of rated burst pressure. Pressure ratings: five to 75 psig. For vacuum applications, unit comes with graphite support bar.

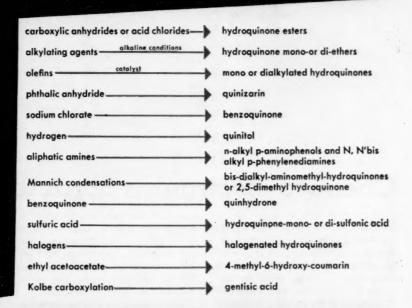
Teflon-Faced Diaphragms: Hills-McCanna Co. (Chicago) now has teflon-faced diaphragms of one-piece construction for use in its diaphragm valves. Diaphragm is a solid teflon sheeting bonded to the face and external edges of an elastomeric backing, combines the chemical resistance of teflon and the hydraulic-shock-absorbing flexibility of elastomeric-type diaphragms. Operating temperatures: -10 to 240 F; line pressures: up to 150 psi.

Tower Packing: Intalox Saddle Packing is now available in carbon from U. S. Stoneware Co.'s Process Equipment Division (Akron, O.). Developed jointly by U. S. Stoneware and National Carbon, the newtype saddles are recommended for hot alkalis, mixtures of hydrofluoric and sulfuric acids, hydrofluoric and phosphoric acids—areas of service where chemical-resistant ceramics would be unsuitable. They can withstand abrupt temperature changes without spalling.

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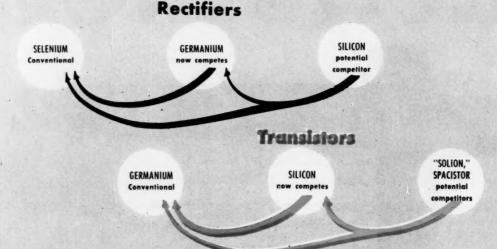
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MARKETS

How semi-conductors will compete in the manufacture of



Chemico-electronics Scramble Gets Hotter

In the past week or so a rash of semiconductor developments, including word on a major plant expansion, new likely producers, and a couple of hot government- and industry-spawned competitive products, point up the highly lucrative—and competition-rife—character of the chemico-electronics industry. It spells out, too, anticipation of a near-fantastic growth in use of such semiconductor materials for the manufacture of transistors, rectifiers, and diodes.

How bright the prospects are is shown in sales figures just released for one segment of the electronics market. Transistor sales in the five months of '57, reports the Radio, Electronics and Television Manufacturers Assn., jumped to almost 9 million units (worth more than \$25 million). Compare that with the 3.6 million units (over \$10 million worth) sold in the same period of '56.

But the biggest growth is yet to come. Current transistor sales (not to mention rectifiers and diodes) represent less than 5% of vacuum tube sales, and the tubes may eventually be completely replaced by transistors.

Taking over the field, however, won't necessarily be a cinch for any one semiconductor material. Selenium—the old-timer among semiconductors—has already suffered because of competition from germanium; and both germanium and silicon may get some unexpected competition from "solion" and "spacistors," two newer electronic devices.

Silicon Soars: Du Pont is constructing at Brevard, N. C., an installation described as "the world's first full-scale manufacturing establishment" for making high-purity silicon. Scheduled for completion in the first half of '58, the plant will be able to turn out a total of 70,000 lbs./year (50,000 lbs. of semiconductor grade and 20,000 lbs. of solar-cell-grade silicon).

Meanwhile, several other producers have started—or are about to start—commercial production of high-grade silicon for electronic uses. Most recent arrival on the scene is Grace Chemical, who last week announced formation of a new company (jointly owned with Pechiney of France) to produce silicon (CW Business Newsletter, July 20). The Grace-Pechiney plant, with about 20,000-lbs./year capacity, will be located on this side of the Atlantic (possibly Puerto Rico).

Texas Instruments this spring announced commercial availability of silicon from its plant in Dallas, Tex. Capacity of the plant is not disclosed, but, says TI, it can deliver "any size production order." Much of the output will presumably go into captive use because the firm already claims control of 90% of the silicon transistor market in this country.

Eagle Picher began making silicon early this year at Miami, Okla., (where they also make germanium). The firm's silicon capacity—now being expanded—has not been revealed.

The Tungsten Chemical Division of Sylvania Electric Products (Towanda, Pa.) makes high-purity silicon for sale and for captive use.

In addition to these producing units, laboratories in a raft of companies are humming with stepped-up research and development programs. About the end of June, the U.S. Army Signal Supply Agency (Phila.) awarded a contract to Philco for research on high-purity silicon. The U.S. Air Force is backing the activities of several research groups, e.g., General Electric's high-purity silicon research, projects at Battelle Research Institute and at Armour Research Institute—all aimed at developing silicon carbide for semiconductor use.

Among others doing research on silicon are Foote Mineral, Kawecki

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MARKETS

Chemical, Merck, Mallinckrodt, Westinghouse and Monsanto. Many companies manufacturing electronics supplies are reportedly engaged in silicon research, as are various government agencies, private consulting groups and university labs.

About 20,000 lbs. of silicon will be used for electronic products this year and probable demand five years hence should hit 100,000 lbs./year; that's how some market researchers are sizing up the future. Others, more optimistic, predict a 90,000-lbs./year consumption by '60. Military needs are an important factor behind the expected rapid growth (in fact, silicon largely financed by the government, whereas the cost of developing germanium has been absorbed by the producers).

Selenium Slips: An end-use breakdown for selenium is hard to find, but the dominant trend was revealed, a few years back, by Bureau of Mines statistics. In 1952, 40% of all selenium consumed in the U.S. went into electrical applications, 40% went into chemical uses (pigments, drugs, rubber, etc.), 13% into glass, 7% into steel. By 1954 the proportion consumed in electrical applications had jumped to well over 50% of the total and has, it's believed, increased steadily each year since then.

Recent reverses of the selenium market are a tip-off to the turbulent competitive atmosphere that increasingly pervades the semiconductor business. Selenium was in tight supply for many years, now is apparently building up to a considerable oversupply. Producers'* stocks at the end of this April (the latest month for which figures are available), amounted to 393,240 lbs.; this compares with stocks of 68,722 lbs. in the corresponding period of '56.

Last summer, selenium shipments (including metal, alloys, and compounds) in the U.S. averaged 90,000 lbs./month; in November '56, shipments dropped to 68,000 lbs., and in December, skidded to a low 45,000 lbs. Monthly shipments for the first four months of '57 averaged about 43,000 lbs.

Selenium production, on the other hand, has remained close to the aver-

*Present selenium producers reporting to the U.S. Bureau of Mines are American Smelting & Refining, Kawecki Chemical, Kennecott Copper, American Metal Co., Ltd., and International Smelting & Refining.

age 93,000-lbs./month output in '56, easing off only slightly to approximately 90,000 lbs./month (just about double the current average monthly shipments).

Selenium imports, too, are running considerably lower this year than in '56; the monthly average last year was 19,301 lbs., compared with an average of 10,000 lbs./month during the first three months of '57.

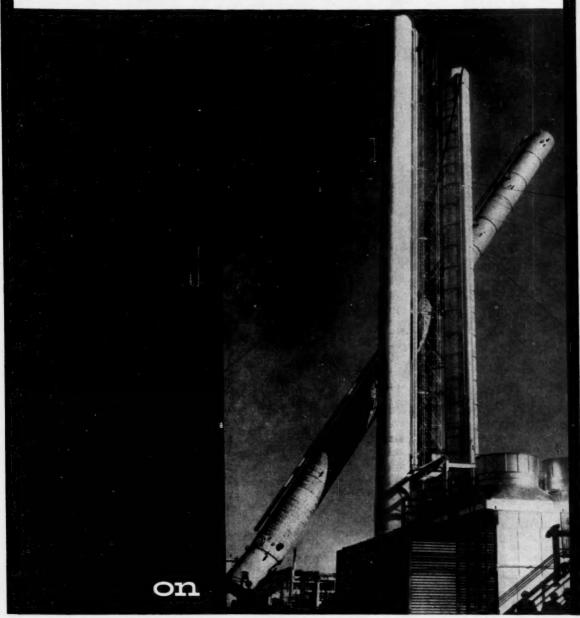
Two factors, say industry experts, have brought about the selenium setback. Consumers are thought to be dipping heavily into their own reserve stocks while stalling until selenium prices hit rock bottom. Secondly, germanium and silicon have already encroached on selenium markets, and the consensus is they will make even bigger inroads in the future. This fact, too, discourages the maintenance of large selenium stocks by consumers. If a sudden, big switch to these other semiconductors should come - and changes in the electronic business often are dramatic-no consumer wants to be stuck with excess stocks of selenium.

Some selenium producers try to minimize the importance of the current down-trend in selenium consumption, say it's only temporary and that demand will gradually climb back to where it was last year. They maintain that selenium has its own specific uses, doesn't really compete with other semiconductors.

There are others, though, who don't go along with this optimistic view of selenium's prospects. The doubters cite, for example, the case of a large Midwestern electronic - equipment manufacturer who made a complete switch from selenium to germanium rectifiers. The changeover was a blow to selenium sales—one that won't be recouped easily. And just last week one Eastern manufacturer of germanium rectifiers, Sel-Rex Corp. (Nutley, N.J.), announced price reductions up to 10%, said the cuts were made possible by "greatly increased produc-

Germanium Growing: How will germanium† fare in the forthcoming battle for semiconductor markets? Very well, according to a survey recently conducted by the Stanford Research Institute. The following high-

†Present U.S. producers of germanium are: Eagle Picher, American Zinc, Sylvania Electric Products, and American Smelting & Refining. styrene by direct recovery from gasoline!



Since early this year, Cosden has been continuously producing styrene monomer from ethylbenzene, which is separated by ultrafractionation from a gasoline-derived xylene mixture.

Three towers in series, each 200 feet in height, make up a 600 foot fractionating column in which ethylbenzene recovery takes place...the key to a new source of styrene for American industry.

Styrene is one of the many petro-chemicals available today from Cosden Petroleum Corporation, one of the world's largest independent inland refineries.



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11

57

Have You An Odor Problem?

Excerpts from monthly news bulletin sent by RHODIA to its sales and engineering staffs.

AMMONIUM THIOGLYCOLATES

Recent developments abroad indicate that three ALAMASK products are excellent for reducing odor intensity and masking ammonium thioglycolates. Potential users can submit their products for evaluation and reodorization. After tests, recommended formulae will be submitted

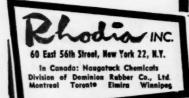
AMMONIA and FORMALDEHYDE

ALAMASK CNG and ALA-MASK CNG-X have been reported to us excellent masking agents for odors traceable to ammonia and formaldehyde. ALAMASK CNG-X will give clear solutions in dilute aqueous ammonia and is generally employed at concentrations of 0.5% to 3%, depending upon the masking requirements.

REFUSE AND WASTES

ALAMASK CNG has also been recommended for use in controlling malodor from refuse dumps and animal wastes. This product imparts a fresh clean fragrance.

These are but a few of the instances where ALAMASK is being used to combat obnoxious malodors, whether they be from processing operations or in end product. Our technical staff is available to work with you on your odor problems.



MARKETS

lights from the report compare future prospects of germanium and silicon in semiconductor applications.

U.S. military needs this year will add up to some 2 million silicon transistors and 5 million germanium transistors; by 1959 the demands will be, respectively, 18 million units and almost 27 million units.

Commercial and industrial uses of silicon transistors this year will total an estimated 250,000 units compared with a demand of 8 million germanium units; in 1959 the expected demand is more than 1 million silicon and about 50 million germanium units.

In home entertainment equipment manufacture (radio, television, tape recorders), germanium transistor use should hit 11 million units in '57 and more than 20½ million in '59.

These estimates, of course, are based on markets for transistors that exist today, and do not take into account uses that may be developed before 1959 (e.g., transistorized fuel injection systems which could account for 30 million transistor units annually).

Solion Sortie: Just out from under wraps, a new electrochemical device called "solion" threatens to invade semiconductor markets. The invention, based on an entirely new principle*, was researched by the Naval Ordnance Laboratory (Silver Spring, Md.), in cooperation with the Defense Research Laboratory of the University of Texas.

According to the Navy lab, the solion "can perform many of the functions heretofore performed by tubes and transistors and may in time replace them in a wide range of electronic applications where high sensitivity and low power consumption are vital".

Others equally familiar with the new device are more hesitant about predicting heavy competition—at least in the near future—in transistor markets. Spokesmen for Texas Research Associates (who will handle nonmilitary commercial developments) soften the implied threat by saying that solions "will not really compete with

ly effective in low-frequency circuits where vacuum tubes and transistor circuiting is difficult. At present the units will not compete at frequencies higher than audio."

In any case it will take about two

transistors because they are particular-

In any case it will take about two years before solions will be commercially available (except for samples), when they will be marketed as a line of computing elements, as control instruments for process controls, etc. Texas Research is now negotiating with two firms for manufacture of the units.

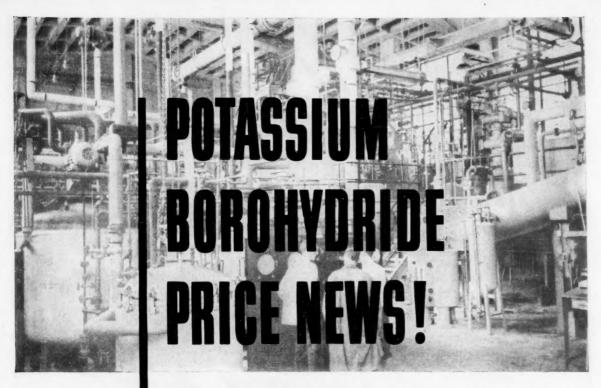
Spotlight on Spacistors: Breaking into prominence hard on the heels of solion's debut is Raytheon's new "spacistor", which, it's claimed, combines the best characteristics of vacuum tubes and transistors.

Physical and operational characteristics of the spacistor were spelled out by the firm's research team early last week, at a joint meeting of the American Institute of Radio Engineers and the American Institute of Electrical Engineers in Boulder, Colo. The device is extremely small (much smaller than a typical transistor), and features low power consumption, shock resistance; in addition, it's claimed to have several important advantages over regular transistors:

Spacistors amplify electric signals forty times more than do transistors and ten times more than vacuum tubes; they operate at temperatures as high as 930 F—more than twice the temperature limit of transistors. And producers of semiconductors will take particular note that spacistors—now made of germanium—do not necessarily depend on the use of highpurity semiconductor materials—i.e., silicon, germanium. The market implications are obvious, but the competitive impact of spacistors won't be felt for several years.

Clearly, makers of transistors, and suppliers of semiconductor materials, will likely face competition from solions and spacistors, although how heavy it will be from each is moot. But right now selenium producers aren't concerned, because such won't affect the rectifier business—besides, selenium producers have bigger worries. Meanwhile, the outlook for germanium and silicon is so bright that producers aren't easily worried by possible competition from "yet unproved" newcomers.

*"Solions" do not utilize semiconductor elements (selenium, germanium, silicon). Electrical currents in the "subminiature, highly sensitive extremely accurate" devices are generated by the movement of ions between platinum electrodes immersed in an iodine solution. The current flow is excited initially by a low-voltage dry cell battery coupled in series with the unit; electrical flow is then sustained and varied by stimulation of the unit by temperature, pressure, light, sound or acceleration.



New low MHI KBH₄ prices expand borohydride applications formerly blocked by high costs

Great news! MHI potassium borohydride (KBH4) is now the lowest priced commercially available borohydride reducing agent. Where high price may have blocked use before, many companies now can profit from KBH4 for faster, easier, higher yield specific reductions of esters, aldehydes, ketones, acid chlorides and acid anhydrides. New production techniques make these new prices possible.

In addition to price advantage, there are many other factors which make MHI KBH4 a uniquely versatile and useful reagent. MHI KBH, is selective. It goes straight to the heart of a specific reduction without side reactions, without affecting other reducible groups present and without attacking olefinic bonds. A white crystalline solid with a purity of 99% and density of 1.175 g/cc, MHI KBH4 is stable and can be handled and stored safely in air without loss of purity. You can use it in conventional equipment employing standard techniques.

Solubility is 19.3 grams/100 grams water. Other solvents are water-methanol mixtures, in which solubility ranges from 13.0 grams/100 grams solvent for a ratio of 4 to 1 water-methanol solution down to 0.7 grams/100 grams solvent for methanol alone. MHI KBH, also dissolves in other water-alcohol mixtures and liquid ammonia. The solubility in dimethyl formamide is 1.2 grams/100 grams solvent and in dimethyl sulfoxide is 7.5 grams/100 grams solvent at 25°C. In general, solubility sharply decreases with higher alcohols and it is generally insoluble in ethers and

hydrocarbons. It has a negative heat of solution in water of 6.3 Kcal/mol.

All of these unique advantages, plus the new low price make it a good move for you to use MHI KBH4 for reactions like these:

TYPICAL ORGANIC REACTIONS:

Aldehyde reduction:

$$O_2N O_2N O_2N$$

Ketone reduction:

$$CH_3C - C_2H_3 + \underbrace{KBH}_{4} \longrightarrow CH_3CHOHC_2H_5$$
(Hydrolysis product)

Ester reduction:

dioxane CH3CH2CH2CH2OH CH3CH2CH2C - C1 + KBH (Hydrolysis product)

GET THE FACTS ON THESE NEW KBH4 PRICES! Call or write for complete information. Technical assistance is also available without obligation.

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Rubber Coated Fuel Tanks Resist Crash Impact, Reduce Fire Risk!

Proved two years running at Indianapolis Speedway, fuel tanks with a special rubber outer-coat held together in severe crashes even though the tank metal split.

The coating employs a THIOKOL liquid polymer as its base. Applied like paint, it cures to a tough, solid rubber at normal temperatures.

THIOKOL liquid polymers have long been used in sealants for the interiors of aircraft fuel tanks, and in marine and building caulking compounds. The versatile polymers also have wide applications in naval and industrial coatings and paints.

"Rubber Coat," the coating successfully used to protect fuel tanks against crash impact, is manufactured with a THIOKOL liquid rubber base by the Products Research Company, Los Angeles, Calif.



CHEMICAL CORPORATION
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*Registered Trademark of the Thiokol Chemical Corporation for its liquid polymers, rocket propellants, plasticizers and other chemical products serving a score of industries.

Washington

Newsletter

CHEMICAL WEEK July 27, 1957 Drug and chemical industry protests have led Sen. Joseph O'Mahoney (D., Wyo.) to revise a proposed bill aimed at curbing time-wasting "defensive" patenting that O'Mahoney tried to get through Congress four years ago. It would allow filing of patent applications without pressing for issuance of a patent—provided the application met current standards for patent claims. Hoffmann-LaRoche counsel Maurice W. Levy has led drug and chemical makers' successful fight to block previous publication bills, contending they curb the incentive to develop and exploit new products. Levy argues that they would result in increased filing of spurious claims, that the real way to cut excessive filings lies in Patent Office enforcement of stricter standards of invention. But support for a publication bill is growing among larger firms in other industries.

A new "compromise" chemical additive law is in the making. The food processing industry and Food & Drug Administration officials show signs of yielding on past rigid positions. That's the upshot of developments as a House Commerce Subcommittee re-opened hearings on the controversial subject last week.

Chemical additive makers are not happy about the new turn in events in which they stand both to lose and to gain. On the plus side, they have talked FDA into giving up its insistence that a new law bar additives that lack a "functional value" in foods—leaving to the consumer the decision of usefulness of such materials as dyes for citrus fruits. On the debit side, they've lost support of the powerful food processing group in their fight to allow a full court review—a lay jury trial—when FDA questions an additive's safety.

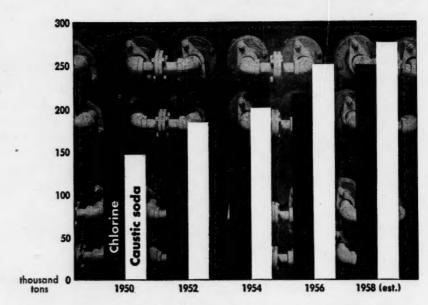
The crack in the alliance between food and chemical groups came last week. Charles Wesley Dunn, testifying for the Grocery Manufacturers of America, hinted that food makers won't insist on the de novo—i.e., jury—trial procedure on questionable additives. He appeared satisfied that industry would be protected against arbitrary rulings by FDA if the agency relies on independent scientists to advise on safety issues—as FDA has proposed.

Can chemical additive makers seek a more acceptable compromise? Perhaps Congress won't act on additive bills until next year; it will want more scientific data first.

There's less "rubber" in BDSA's Chemical and Rubber Division these days. The division's 12-man rubber section was trimmed to one—S. Earle Overley—plus a secretary, on July 1. From now on, U.S. rubber industry statistics will be reported by the Census Bureau, not BDSA:

Charting **Business**

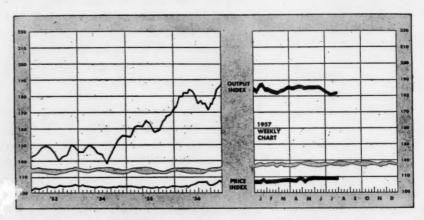
CHEMICAL WEEK July 27, 1957



Canada's Chlorine/Caustic Output Up

for caustic and chlorine is expected to send production of these chemicals to output of caustic soda and chlorine is of caustic, 90,000 tons of chlorine.

Canadian industry's ravenous appetite expected to hit 275,000 tons and 250,000 tons. Taken: pulp and paper producers, 145,000 tons of caustic and 150,000 tons new heights. By the end of next year of chlorine; heavy chemicals, 75,000 tons



Business Indicators

WEEKLY	Latest	Preceding	Ago
	Week	Week	175.5
Chemical Week output index (1947-49=100)	180.0	180.0	175.5
Chemical Week wholesale price index (1947=100)	110.4	110.3	105.6
Stock price index of 11 chemical companies (Standard & Poor's Corp.) (1941-1943=10)	46.70	47.21	50.25

MONTHLY—Trade (Million Dollars)	Manufacturers'			Manufacturers'		
(Million Delicity)	Latest	Preceding Month	Year Ago	Latest	Preceding Month	Year Ago
All manufacturing	18,586	28,586	27,814	52,832	52,577	48,566
Chemicals and allied products		2,024	2,097	3,925	3,879	3,479
Petroleum and coal products	2.793	2.810	2.633	3.268	3.174	2,828



News from

National Carbon Company

Division of Union Carbide Corporation • 30 East 42nd Street, New York 17, N.Y. Sales Offices: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco. In Canada: Union Carbide Canada Limited, Toronto

PROCESS EQUIPMENT BRIEFS

New Data Sheets Give Product Specifications on "Columbia" Brand Activated Carbon

Designed to facilitate selection of proper type and grade of "Columbia" Activated Carbon in gas purification, gas separation, air conditioning, and catalyst applications. Includes product description, typical applications, properties, screen analyses and pressure drop curves. Request supplement to Catalog Section S-6450.

Technical Information on "National" Carbon Brick Now Includes Corrosion Resistance Tables



Cover use of "National" Carbon Brick for lining tanks, reactors and similar process vessels containing corrosive liquids or gases. Photograph above shows "National" Carbon Brick linings and "Karbate" Plate Type Heat Exchangers in nitric-hydrofluoric acid stainless steel pickling tanks.

Catalog Section S-6215

HCI Storage — Leading Facilities Use "Karbate" Centrifugal Pumps



"Karbate" Centrifugal Pumps load and unload commercial strengths of hydrochloric acid at tank farms. Pump capacities up to 1500 gallons per minute at heads up to 125 feet cover wide range of loading requirements.

Catalog Section S-7250

"KARBATE" Impervious Graphite Vital to Increasing HCI Production

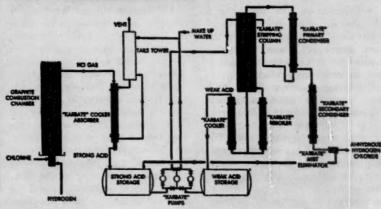
Major Plant Items: "KARBATE" Falling-Film Absorbers, Stripping Towers, Boilers, Coolers, Condensers, Pumps and Piping.



Process improvements made possible by National Carbon's introduction of impervious graphite have established hydrochloric acid and anhydrous hydrogen chloride as major industrial chemicals. Today, "Karbate" impervious graphite equipment is used in all HCl production processes.

Photograph at left shows typical plant equipment producing anhydrous hydrogen chloride from byproduct HCl. Flow sheet below emphasizes the role of "Karbate" impervious graphite in this operation; the "National" Graphite Combustion Chamber shown is frequently used to produce raw HCl gas by combustion of hydrogen and chlorine.

The durable construction of "Karbate" shell and tube heat exchangers, towers and centrifugal pumps is important to the design and continued economy of all types of HCl processes. A wide range of items available from stock at moderate cost. For details on "Karbate" equipment in HCl production, request Catalog Section S-7460 NL.





The terms "Karbate", "Columbia", "National" and the "N" and Shield Device are trade-marks of Union Carbide Corporation

ADMINISTRATION





WIDE

JONES, GALLO: Their goal is company-wide contracts.

Steering 65 Cement Strikes

A strike with multiple implications for process management at large is the work stoppage that by last week had closed about 65 cement plants throughout the nation. The strikes have idled more than 15,000 employees, cutting total U.S. cement production by nearly 60%.

Significance for chemical process management:

• The strikes involve the Cement, Lime & Gypsum Workers' continuing effort to establish three principles: (1) wage increases to be retroactive to termination dates of previous contracts; (2) employers' work contracting rights to be limited; and (3) establishing company-wide bargaining—on the basis of an industry-wide pattern.

 Construction jobs (including a few chemical expansion projects) in many areas are being halted by the work stoppages. Result: decreasing demand for process-industry products used in construction work.

Conflicting Practices: There have been large-scale union-management disputes in this industry before, notably in 1954, when retroactivity was the most important single issue. But this year's set-to has topped all previous records, and retroactivity again is a principal stumbling block. To some extent, it appears that conflicting practices on the part of the union and the industry are responsible for the recurring clashes on this point.

The union's bargaining goals are decided at its biennial conventions, after local parleys. Conventions are usually held in October, and bargaining begins in March, with most contracts expiring April 30—near the start of the big warm-weather construction season.

But management often finds, upon entering those Spring-time negotiations, that its ability to grant substantial wage concessions is limited by a cost-price factor that became fixed several months earlier when—in accordance with industry practice—the cement companies announced their second- and third-quarter price schedules. Understandably, no producer wants to shave his profit margin during his peak sales season.

The Right to Manage: Whether construction and alteration work should be done by a plant's regular production and maintenance employees or should be let out to a contractor (whose employees often are members of building-trades unions) has frequently been a source of friction between a manufacturing company and its employees. This point also has long been a major source of contention between the industrial-type unions that formed the CIO and the old-line craft unions that clung to the AFL.

The cement workers' demand for inclusion in 1957 contracts of a clause giving them priority for such work has been opposed as an abridgment of

management's basic right to manage. One producer—Marquette Cement Mfg. Co. (Chicago)—came to terms with the union on this and other issues on July 1; and since then, the union has been asking other companies to accept similar settlements.

Marquette President W. A. Wecker says his company's new contracting clause* has been "grossly misrepresented" as a surrender of traditional management prerogatives.

AFL-CIO Support: The cement workers—headed by President Felix Jones and Secretary-Treasurer Toney Gallo—also are seeking other companies to agree to the economic terms of the Marquette settlement: a 16¢ package that includes a 13.6¢ average hourly wage increase and various new fringe benefits.

These demands are getting full endorsement from AFL-CIO President George Meany, whose recent letter to Jones describes the cement industry as "one of the most profitable."

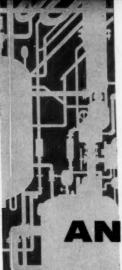
With their selling prices already nailed down for April through September, all but a handful of cement companies have rejected the union's original 20¢ demand as unreasonable and have been offering package deals ranging from 10 to 16¢. This has led the union to make two accusations, both denied by industry management. The union's charges or insinuations:

• That the companies' 10¢ offers were made to force the union to strike, thus creating a temporary shortage of cement and setting the stage for future price increases.

• That the companies—though they have disbanded the old Cement Institute that was attacked by the U.S. government in a 1945 antitrust suit against illegal price-fixing—are acting in concert in labor relations through sending their personnel managers to attend industry safety meetings.

Outcome of this year's cementplant strikes is likely to have strong influence on bargaining tactics used by other process industry unions, which have many of the same objectives as the 18-year-old cement workers' union.

*Wecker quotes the new clause thus: "The company will not, so long as it has proper equipment and personnel, contract to any other company work which is customarily performed by employees in the bargaining unit; but if the company determines it does not have the proper equipment or personnel, it may contract the work out."



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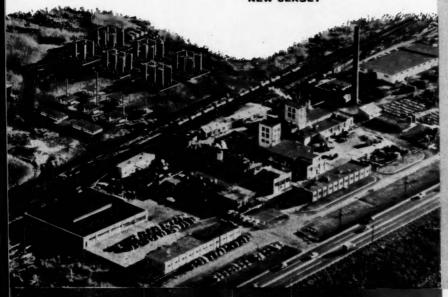
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ADMINISTRATION

Union's Forced Retreat

Labor unions in general and process industry unions in particular fear that they're being gently nudged into a tactical position that lies just south of the proverbial eight-ball. In a report last week to union members, the research and education dept. of the Oil, Chemical & Atomic Workers Union (AFL-CIO) says that this is because of the decreasing ratio of hourly-paid employees to salaried employees—a trend that "is even more marked" in the oil and chemical industries.

In addition to a general weakening of organized labor's collective-bargaining strength, the personnel shift involves three major dangers for all unions concerned, according to OCAW researchers:

 A large proportion of the total work force is likely to be in unorganized, hard-to-organize groups.

 Lower pay standards of many clerical and other white-collar workers will tend to hold down wages and working conditions for the organized production workers.

• Effective strike action by the production workers may not be possible if other employees are available to take over plant operations—and this is becoming more feasible as a result of automation.

The research staff bases its report on these figures from the U.S. Bureau of Labor Statistics, showing employment changes from 1947 to '56:

All manufacturing — number of white-collar workers up 51.6%, production workers up 3.0%.

Chemicals and allied products—white-collar workers up 65.3%, production workers up 5.8%.

Petroleum refining — white-collar workers up 46.7%, production workers down 6.9%.

What—if anything—can OCAW do to keep from losing relative strength in the industry? A union spokesman concedes that there are no specific plans, other than the intention to keep on trying to organize white-collar workers wherever possible.

OCAW officials hope this report will prod members to be more zealous about trying to bring their white-collar cousins into the union. They will undoubtedly bring this subject up at the OCAW convention Aug. 12-16 in Chicago, and in the AFL-CIO's industrial union dept.

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NOW IN FULL PRODUCTION - Antara Chemicals' new surfactants plant at Calvert City, Ky.

Linden, N. J. and Rensselaer, N.Y., plants and warehouses, where surfactants are produced and stored.

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Antara's new surfactant chemicals plant at Calvert City, Ky. is now in full production of Alkylphenols, Igepal® and Alipal®. This represents another step in GAF's program to assure continuity of supply by means of multi-plant production facilities and nation-wide distribution points.

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ADMINISTRATION



Pennsalt's Ramstad talks to students during plant tour, part of . . .

Bid for Future Manpower

A three-way program to help "sell" high school students on scientific and engineering careers is being used by the Tacoma, Wash., Engineers Club. The 'club's method: a combination of plant visitations, counselling and an annual banquet-gabfest.

The counselling phase of the program has been in operation for some time—providing engineers to work as advisors with sophomore, junior and senior students in each of a dozen schools in the Tacoma area—but club members have felt all along that something else was needed. To fill in the blank spot, it was decided this spring to try a series of plant visits, "to display science in industry more realistically."

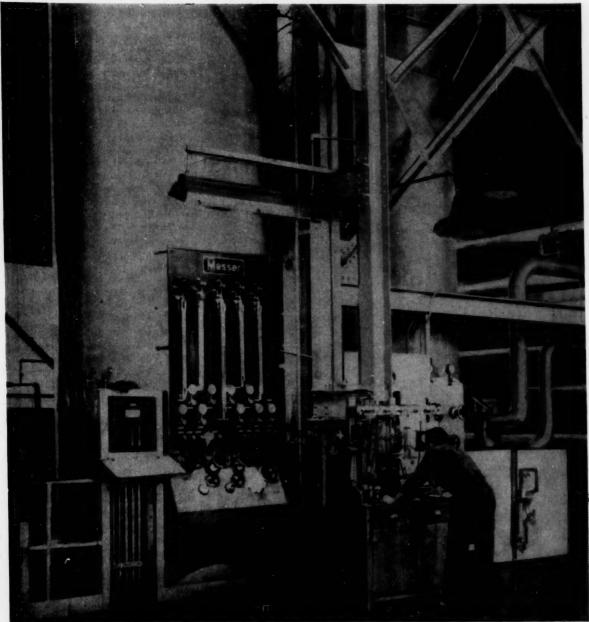
Pennsalt Visited: Eight Puyallup High School students and their advisors made up the first visitation group. After an hour-long tour of Pennsalt Chemical's Tacoma plant, the group heard a lecture by Hooker Electrochemical Corp. Technical Superintendent John Judy—long active in the club's student programs — on the attractions of science in general. Marshall Ramstad, Pennsalt's local market research manager, discussed employment opportunities in the industry.

Student interest was reflected in such questions as, "What does a chemical engineer do when he starts work?" and "How much time must I spend in education to become a chemical engineer?"

Highlight of the program in the past has been the annual Spring banquet-gabfest, attended for the most part by seniors. Informality is the rule, and approximately 75 students interested in higher scientific and engineering education are paired off with an equal number of engineers. Discussion at the various banquet tables is encouraged, led by the presiding engineer at each table. The best questions from each table are shared with the entire group.

Club members so far are encouraged by their program—part of a continuing and widespread chemical process industry effort to attract scientific and engineering talent on all levels, now and for the future (CW, July 13, p. 86).

Explaining the newest phase of the club's program, Judy cautioned that plant visits alone aren't enough. "Students see more than they can absorb." The engineer conducting the tour does have certain advantages over the classroom, he adds, and the student visualizes the place in industry he might fill. "We are convinced the plant visitation, combined with round-table discussions at the banquets, holds much promise as a means of interesting students in science."



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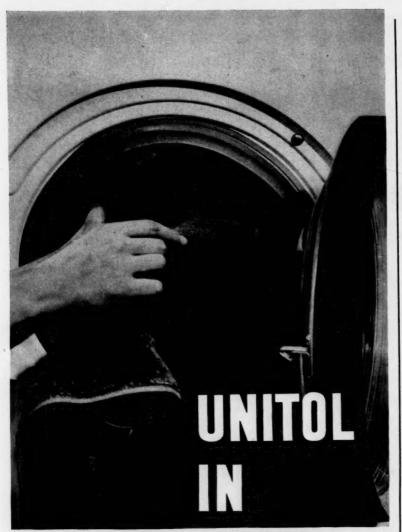
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ADMINISTRATION

LEGAL

Celanese Pollution Suit Ends: Celanese Corp. of America has settled a \$2,978 suit against it by agreeing to purchase 160 acres of land next to its Bishop, Tex., plant. The suit grew out of damages to crops on the land allegedly caused by the plant.

The suit was filed three years ago by H. H. Deaver and Mrs. Virginia Deaver Graham, guardian of her son, Jack Graham, asserting that flax and grain crops on 320 acres of land owned by young Graham and farmed by Deaver were damaged by poisonous gases and fumes from the plant.

In the compromise settlement filed recently in 94th district court (Texas), Celanese agreed to buy 160 acres of the land for \$48,000 and pay an additional \$1,901 for any damages that may have occurred.

Chanel Wins Decree: Chanel, Inc. (New York), has been granted an interlocutory, or intermediate, decree in federal district court (New York), charging that Leopold Suttner, doing business as Le Sure Product Co. (New York), is in contempt of a 1956 final injunction prohibiting infringement of Chanel's trademark "Chanel No. 5." The '56 injunction cited the defendant's use of "C No. 5" as infringing.

Because of the final judgement already entered in the case in 1956, Federal Judge John Cashin said his task now is confined to determining whether the packages defendant attempted to utilize are within the purview of the '56 judgement,

The decree refers the case to a master for computation of the fine to be assessed and accounting of profits.

'Persulan' Ads Curbed: The Federal Trade Commission — following an agreement between parties providing for entry of a consent order—has ordered Drake Laboratories, Inc. (Detroit, Mich.), Morris S. and Elaine Plotkin and Joseph P. Boltach, Jr., individually and as officers of Drake, to cease and desist representing falsely that their hair and scalp preparation, Persulan, prevents and overcomes falling hair and baldness, causes new hair to grow, restores healthy scalp and relieves skin irritations and ailments.

The firm was given 60 days in which to comply with the order.

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ADMINISTRATION



SAFETY MAN DEVEY: To pep up interest, a play day and dinner.

LABOR

Family Day Fiesta: To celebrate the plant's current safety record and to renew employee interest and enthusiasm in the safety campaign, a "family day" observance was held recently at the Rensselaer (N.Y.) works of General Aniline & Film Corp. Employees were released from work at noon, but returned to the plant with their families for an afternoon of relaxation. The front lawns of the plant were made into a children's playland, festooned with colored balloons. For adults, principal attraction was the safety display set up in one large building. On exhibit were hundreds of pieces of safety equipment, safety devices and safety materials that were used in preventing any lost-time accidents in 2 million man-hours of plant operation. Most of the people at the outing and dinner wore caps bearing the slogan: "We have two, let's try for three." Plant Safety Director John Devey-who had charge of the celebration-credits a concerted effort by both management and labor for the improvement in plant safety: 55 timeloss accidents in 1953, only three last year, and none so far this year.

In Brief: At Cleveland, Standard Oil (Ohio) is suing the Oil, Chemical & Atomic Workers (AFL-CIO) for \$856,000, alleging secondary picketing of construction work at its Toledo refinery . . . Union Carbide is distributing more than \$54 million to 61,758 employees this month, under its employee savings plan; \$13 million of the total was added by UCC.



Dogs may have it bad in the hot humid period known as dog days. But, dog days are rough on anhydrous caustic, too!

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So, Sperry Rand's engineers put in a PERMUTIT ion-exchange system that

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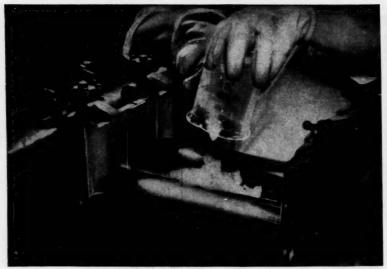
In the same way, ion-exchange cuts costs in anodizing, bright dipping, pickling, brass etching, copper stripping. It also recovers copper and zinc from rayon wastes, concentrates uranium from complex ores, removes im-

purities from sugar, drugs, antibiotics.

We'll be glad to show you how ionexchange will improve your processing and products. The Permutit Company, Dept. CW-7, 50 West 44th Street, New York 36, N. Y., or The Permutit Company of Canada, Ltd., Toronto 1, Ontario.

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ADMINISTRATION

IDEAS

Corporate Alumnus Program: Smith, Kline & French Foundation—independent philanthropic arm of Smith, Kline & French Laboratories (Philadelphia)—has extended its corporate alumnus program to include independent secondary schools.

Since 1956, when the foundation's program began, SK & F has matched \$16,000 contributed to colleges by employees; it will now do the same to high-school level institutions.

Fund-Raising Film: Procter & Gamble Co. (Cincinnati) this year is making a fund-raising film entitled "The Quiet Crowd" available to Community Chests and United Funds.

The 16-mm. color film—emotional in appeal—runs 14 minutes, and will cost local groups approximately \$79 per print.

KEY CHANGES

R. T. Collier, to president; and Homer Reed, to vice-president; Collier Carbon and Chemical Corp. (Los Angeles), subsidiary of Union Oil Co. of California.

Robert M. Dunning, to senior vicepresident, Vick Chemical Co.

Frank J. Juchter, to vice-president and director; and Donald S. Marshall, to manager, Seed Treating Division; California Spray-Chemical Corp.

William H. Schuette, to director, Dow Chemical Co.

Stephen G. Capkovitz, to manager, Perfume, Flavor and Aromatic Chemicals Division, S. B. Penick & Co. (New York).

Bryce L. Rhodes, to general manager, Phosphate Chemicals Division, International Minerals and Chemical Corp.

William R. Todd, to president, Sponge Products Division, B.F. Goodrich Co.

H. Harold Bible, to vice-president and assistant general manager, Lion Oil Co. Division, Monsanto Chemical Co.

RETIRED

F. M. Daley, president, Sponge Products Division, B. F. Goodrich Co.

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FULL DECORATION -ON TOPI -ON SIDES!

Use it to give new sales life to an old product . . . or to get a new one off with a big head start!

CLINCHED NOZZLE!

It's another "first" from Canco-a can with a completely dripless nozzle. It pours freely, instantly, yet it won't drip a drop when the can is righted. But that's

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If you manufacture or distribute one of the specialties listed above or one like it, find out now how this new Non-Drip Can will help broaden your market, increase your sales. Contact your nearby Canco representative today.



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NEW YORK . CHICAGO . SAN FRANCISCO



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Chemical Week

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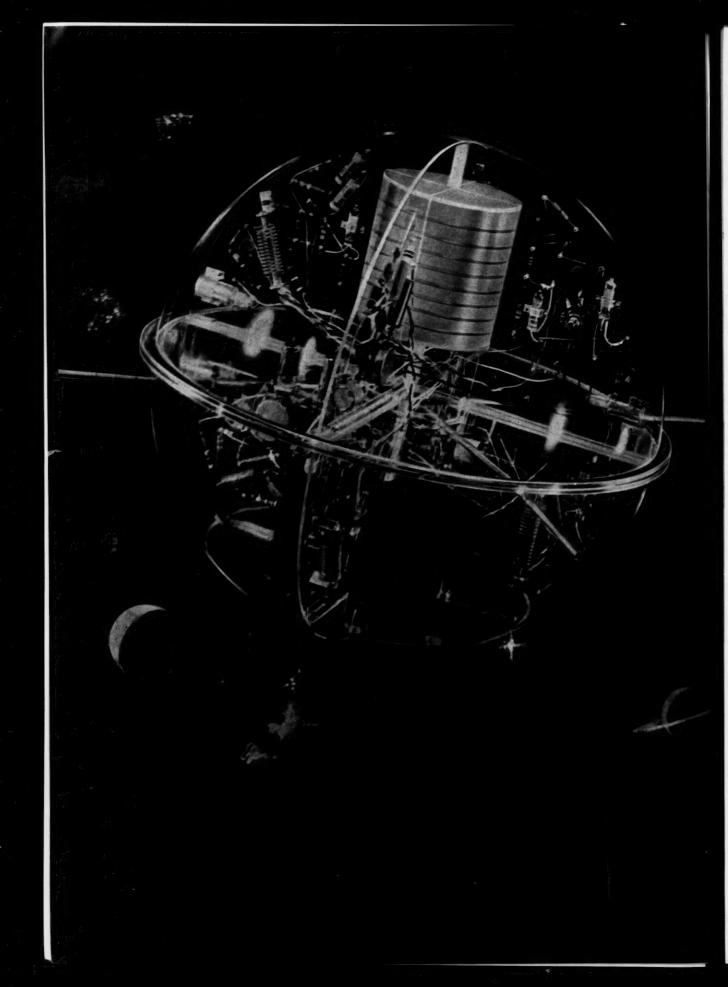
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CHEMICAL SHOWCASE

INSPACE

EXT year's launching of the Vanguard earth satellite from Patrick Air Force Base (Fla.) will propel into space a colossal chemical showcase. The artificial satellite will soar to a point 300 miles above the earth, and there—moving at about 18,000 mph.—try to establish an orbit. If it succeeds, it will be, in large measure, a tribute to the ingenuity, resourcefulness of the chemical process industries.

The launching vehicle is a three-stage rocket resembling an oversized 50-caliber shell. From titanium-tipped nose cone to gimballed exhaust cone, it measures 72 ft., has a take-off weight of approximately 22,600 lbs. The payload nestled inside the nose cone: a 20-in.-diameter, 21½-lb. instrumented satellite sphere.

Each payload pound requires a little more than 1,000 pounds of launching vehicle.

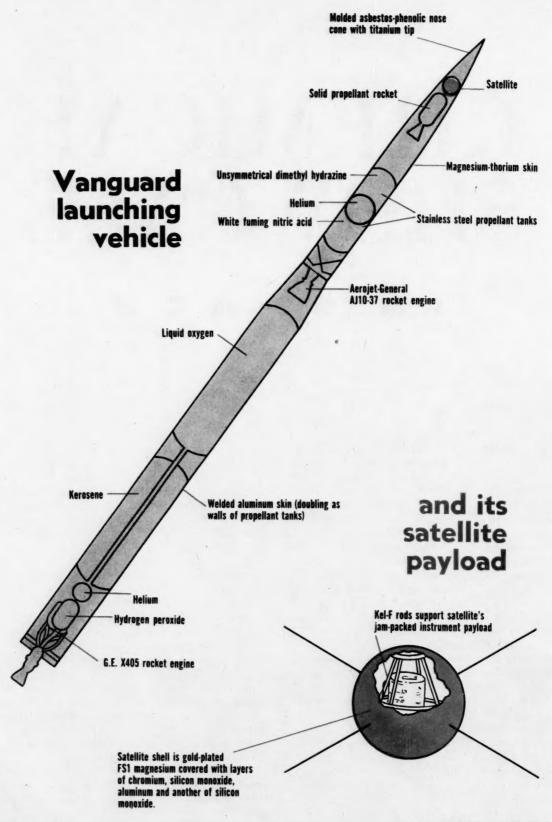
Broken down by stages, the weight factor takes on even greater significance. Each additional pound in the first stage reduces velocity by one ft./second; in the second stage, by eight ft./second; and in the third stage, by 80 ft./second.

To minimize the drag of unnecessary pounds, it is most important that the structural materials used in the satellite vehicle be as light as possible. But it's equally important that they possess sufficient strength to withstand extremely severe environmental conditions (both internal and external).

These include: steady state accelerations to 35 G's (one G equals the acceleration of gravity, 32.2 ft./sec./sec.); rotational speed of 150 rpm.; linear speeds to 18,000 mph.; temperatures approaching 5000 F; erosion (external) by dissociated and ionized gases; erosion and penetration by meteoric dust particles; corrosion by hot chemical propellents and their reaction by-products; shock and vibration from the start-up and operation of three rocket motors.

To meet all these requirements, missile men were forced to employ some rather advanced design, processing and manufacturing know-how—much of it contributed by the chemical process industries. Cases in point:

- A monocoque structure in which the skin of the first-stage rocket doubles as walls of the main propellent tankage. The first stage will be welded aluminum construction.
- In the second stage, which must sustain more severe environmental conditions, magnesium-thorium will be used for the skin, stainless steel for the propellent tankage.
- The nose cone will be molded of an asbestosphenolic material, have a titanium tip.
- The satellite shell will be fabricated from FS1 magnesium alloy, coated externally as follows: first, the sphere will be plated to 0.00005 in. with gold upon



which a layer of chromium will be vacuum-evaporated. These base layers will then be covered with a layer of silicon monoxide and a thin aluminum coating. A second coat of silicon monoxide will increase the whole external coating to a thickness that will provide the desired thermal emissivity. To reduce internal corrosion and heat transfer, the inside of the satellite sphere will be plated with gold.

· Support rods of Kel-F plastic will be used to support the satellite's payload of subminiaturized instruments.

By Stages: Though Project Vanguard will pass through an extensive preliminary test program, the only test of the CPI's know-how (as well as its products) that will count will come when the vehicle takes to the air. It will begin with the ignition of General Electric's X405 first-stage engine.

The firing of an electrically actuated pyrotechnic igniter will start the Vanguard missile on its way. A fusible link on the igniter melts to initiate preliminary partial opening of the oxidizer control valve. After a timed delay, the main fuel valve opens.

Reactant tanks are pressurized with helium gas. Flowing under tank pressures and gravity, the reactants -liquid oxygen and kerosene-combine and ignite in the combustion chamber. A combustion indicator.

placed across the exit nozzle, signals the hydrogen peroxide valve to open.

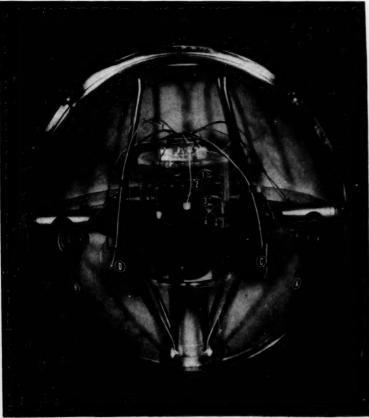
The 90% hydrogen peroxide is decomposed on a silver catalyst screen to generate high-temperature steam. The steam powers a single-stage impulse turbine geared to twin centrifugal pumps. The pumps force more helium into the propellent tanks, thereby building up pressure and creating additional thrust by the firststage powerplant.

From the turbine, exhaust steam flows through ducts to small movable jet nozzles that control the roll of the

Propellent flow to the thrust chamber is controlled by pneumatically operated valves in the pressure lines. Propellent ratio is regulated by a variable-opening valve in the liquid-oxygen line. From the control valve, liquid oxygen is circulated to provide cooling before it is injected into the thrust chamber.

The thrust chamber itself is gimballed to provide thrust vector control. Two double-acting actuators using a petroleum-base aircraft hydraulic oil do the positioning. The hydraulic oil is moved by a constant-volume pump driven by the hydrogen peroxide-powered turbine.

Engine cut-off is initiated by signals that close the oxidizer, fuel and hydrogen peroxide valves. Immediately after burnout, six hollowed-out explosive bolts



What's Inside the Satellite

Some of the subminiaturized equipment aboard the earth satellite is shown in the photo at left.

A. Cell operated by solar energy to reset peak-memory storage unit once each globe-circling revolution.

B. Ion chamber for ultraviolet detection.

C. Thermistor semiconductors for temperature measurement.

D. Erosion gauge to measure surface erosion caused by micro-meteorites.

1. Minitrack transmitter for telemetering data to ground stations.

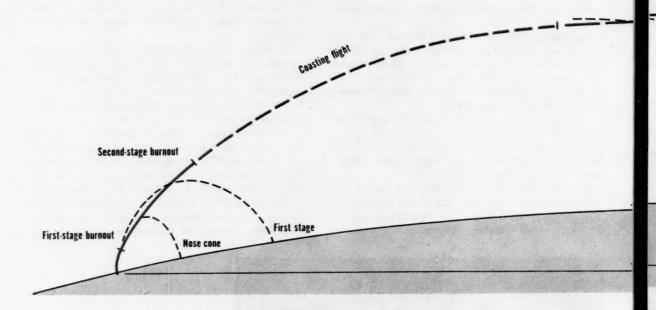
2. Magnetic-core memory for storing count of meteoritic collisions.

3. Telemetry coding system for sampling stored data.

4. Magnetic-core memory unit for storing ultraviolet radiation data.

CHEMICAL SHOWCASE

IN SPACE



that join the first stage to the rest of the vehicle are fired to drop the first stage into the ocean.

At this point, the first-stage engine will have generated about 27,000 lbs. of thrust (sea level) to push the vehicle to a speed of about 3700 mph., an altitude of 35 statute miles. Total elapsed time: approximately 90 seconds.

Stage Two: After the first stage separates from the vehicle, the second-stage Aerojet-General AJ10-37 liquid-propellent rocket engine ignites. Second-stage propellents—white fuming nitric acid and unsymmetrical dimethyl hydrazine—are fed into the combustion chamber by high-pressure helium. Unlike the first stage, the second stage has no fuel pump. Helium is kept under high pressure in a spherical tank located between the fuel and oxidizer tanks.

A gimbal mounting system and hydraulic actuators similar to those used in the first stage also provide thrust vector control in the second. In place of the hydrogen peroxide-powered turbine employed in the first stage to drive the hydraulic actuator pump, the second is equipped with a battery-powered, electric motor-driven pump. And in place of exhaust steam,

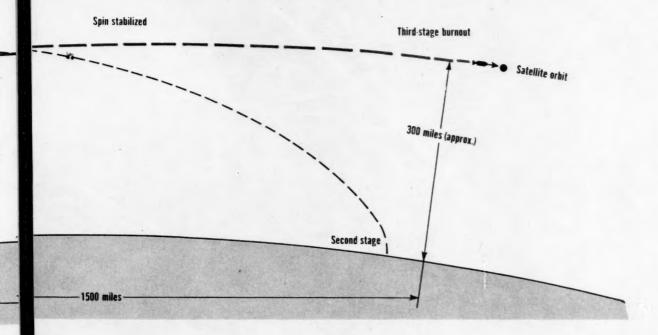
propane is burned to provide the exhaust gas to auxiliary jets that control the roll of the second stage.

As soon as the second stage passes through the denser atmospheric layers, a second set of hollowed-out explosive bolts will be detonated to jettison the nose cone. This will expose the satellite and the third-stage rocket that will push it into its permanent orbit.

Still under power, the second-stage engine carries the vehicle along a curving trajectory to an altitude of about 140 miles, a speed of about 9100 mph. At burnout, the second stage—unlike the first—continues on course with the third stage, coasting to an altitude of about 300 miles. This is the injection altitude, the point at which the satellite will become established in an orbit—if it attains the required injection velocity. Providing the added push is the job of the third-stage engine.

Revving Up: A large solid-propellent rocket, the third-stage engine is mounted on a turntable rotated by small solid-propellent rockets. Described as the most powerful solid-propellent rocket motor ever undertaken, the last-stage engine will burn either Grand Central Rocket Co.'s composite rubber-base propellent or

Here's how earth satellite will be hurled into space.



Allegheny Ballistics Laboratory's (Hercules Powder Co. subsidiary) double-base propellent. Naval Research Laboratory, which has charge of the technical program for Project Vanguard, has not yet made its choice.

When the rocket reaches injection altitude, a coasting-time computer will signal the start-up of the small turntable rockets. Burning for about one second, these small rockets will set the third stage spinning about its longitudinal axis at about 150 rpm. The spinning motion will then actuate a release mechanism to free the third stage from the turntable.

The satellite and third-stage rocket will be separated from the vehicle by the firing of the two retro-rockets that will retard the second stage in its coasting flight. After coasting clear of the burned-out vehicle, the third-stage rocket will be ignited by a delay fuse. The solid-propellent rocket carries no guidance system, depends on its spinning motion to maintain it in the course established by the position of the second stage at separation.

After ignition, the third-stage rocket will boost the satellite from its 9000-mph. coasting speed to the injection velocity of 18,000 mph. At burnout, a special

separation mechanism will free the satellite from the empty third-stage casing Although there will be a slight velocity differential between the satellite sphere and the empty casing, the final velocity of the latter will be great enough to permit it to continue on in the satellite orbit for a short time.

Final third-stage burnout will occur approximately 10 minutes after launching, about 1500 horizontal miles from the Florida launching site. At this point, the satellite vehicle will become the fastest flying object ever manufactured and set in motion by man.

If everything goes as planned up to this point, the satellite will remain in its orbit for about two weeks, circling the earth once every 90 minutes. Then as it is slowed by friction, it will drop down into the denser atmosphere and be destroyed.

Lofty Proving Ground: The satellite's meteoric end will mark a signal triumph over a multitude of unknowns. For the chemical process industries, the high-flying experimental showcase will have provided a momentous test of new materials, advanced design and fabricating techniques, and the latest high-temperature reactions.



Captain of the Vanguard team, Hagen coordinates industrial and scientific crash programs.

He Spearheads the Satellite's Spring into Space

A key part of the U.S. program for participation in the International Geophysical Year, the earth satellite project is sponsored by the National Academy of Sciences and the National Science Foundation. The man responsible for execution of the project is John Hagen, pictured above at the U.S. Naval Research Laboratory (Washington, D.C.) with a scale model of the launching vehicle and full-size model of the satellite sphere.

Prime contractor for the over-all project is The Glenn L. Martin Co. (Baltimore, Md.). Martin, with the help of 10 subcontractors, is handling construction of the launching vehicle.

Among others engaged in crash programs to ready Vanguard for launching early in 1958: G.E., supplying the first-stage engine; Aerojet-General, the second-stage engine; either Grand Central Rocket Co. or Allegheny Ballistics Laboratory, the third-stage rocket; Atlantic Research, the small rockets for rotating the final stage, retarding the coasting flight of the burned-out second stage.

The packaged "brain" that will direct the rocket thrust to keep the vehicle on course is being built by Minneapolis-Honeywell Regulator Co. Brooks & Perkins, Inc. (Detroit), fabricated the magnesium shell of the 20½-in. diameter sphere.

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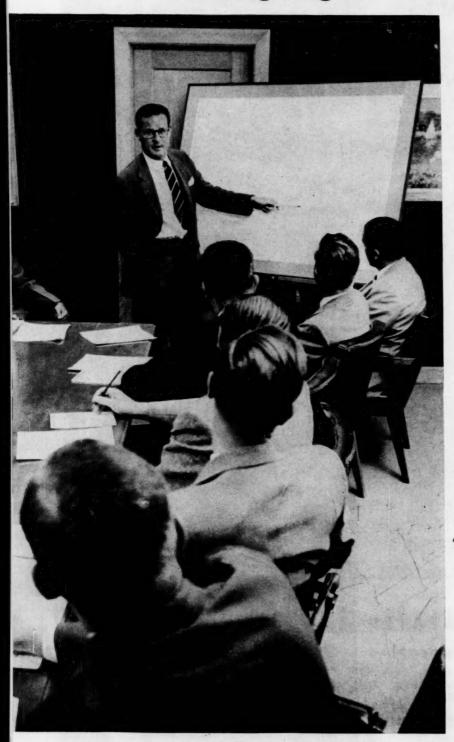
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Designing for Diversified Selling



'Buck' Francis describes new setup to AmPot sales staffers.

When American Potash & Chemical Corp. opens its new Chicago office next month, it will put the finishing touch on a newly emerged sales organization especially designed to cope with the problems that product diversification and rapid growth pose for a medium-size firm.

AP&C has strived to achieve a tailored blend of three types of sales structure—industry, territorial, product-manager—while avoiding the costly burden of a completely divisionalized organization. Moreover, the company's technical service function has been formally organized to coordinate production, market development and sales activities.

The new look at AP&C derives directly from jackrabbit growth. Sales jumped from \$18 million in 1952 to an expected \$44 million for this year. Only five years ago, the firm marketed only five main products—potash, borax, salt cake, soda ash and lithium carbonate. Now, some 60 products are available. And over the same span, the sales staff has swelled from 13 to 34 men.

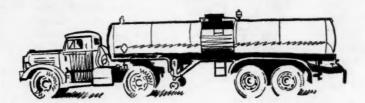
Hence, says AP&C's sales vicepresident, William "Buck" Francis, the old sales organization fast became obsolete. The earlier structure was basically the straight product-manager variety. Besides being too small to handle the flood of new business, the organization also contained two anomalies: the responsibilities of a nonexistent lithium product manager were divided among all product managers; the Eastern general sales manager and the assistant Western sales manager doubled as product managers.

AP&C's new setup eliminates much double functioning, straightens out line and staff relationships and provides for easier handling of increased volume and product lines. Here's how American Potash expects the setup to work:

The company now has three general sales managers. In the East, one handles the heavy chemicals division (borax, potash and sodium sulfate) and another, the industrial chemicals division (lithium and boron chemicals, electrochemicals, Alkarb and new products). Each individual product line

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prime source for



liquid alum

From Tacoma, Stauffer—first major producer of liquid alum—now delivers liquid alum to your delivery dock by tank truck or tank car.

Similar deliveries in unlimited quantities continue to be made from Bastrop and Springhill, La., Houston, Tex., San Francisco, Calif., and No. Portland, Ore.

Stauffer's Liquid Alum meets the papermaker's most exacting demands for purity and uniformity...meets American Water Works Association's standards for treatment of water and sewage.

Stauffer also supplies papermakers with:

ALUMINUM SULFATE (Dry Alum)
SODIUM SULFATE (Salt Cake)
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Mississippi River Plant Sites For Sale or Lease



- A. Industrial District—1470 acres
- B. Industrial Area—1180 acres
- C. Residential Area-1750 acres

Riverlands HEART OF AMERICA'S NEWEST INDUSTRIAL FRONTIER

Industry in 1956 announced plans to invest nearly \$400,-000,000 along the Mississippi River between New Orleans and Baton Rouge, Louisiana.

Here's Why:

Unlimited industrial water; deep water shipping; vast stores of oil, low-cost natural gas, sulphur and salt; economical electric power; cooperative community attitude; mild, year-round climate; access to markets and sources of supply, both domestic and foreign, and 10-year tax exemption.

Riverlands, a Webb & Knapp, Inc., project in the middle of this area, offers industry:

Industrial districts—Will divide into small and large plant sites. Served by highway, rail, air and deep water transportation. Buildings for lease designed and built to your needs. (The Du Pont Company polychemicals department has purchased 700 acres in Riverlands.)

Unsurpassed housing for plant personnel in new, fully-planned community of 4000 homesites nearby.

Mississippi River Development Corp. WFRR 2 KNADD INC.

383 Madison Ave., New York, Plaza 9-7800 Carondelet Bldg., New Orleans, Express 3434

SALES

has a product manager who reports to the general sales manager responsible for the division. District sales managers, one for each of six Eastern districts, supervise field selling.

AP&C's Western sales setup is organized somewhat differently. Because the market is concentrated and relatively small, some industry-type organization is possible. Thus, the Western general sales manager controls three divisions: the agricultural chemicals (fertilizer, fumigant and insecticide products); the industrial division (chiefly soda ash, salt cake, phosphoric acid, sodium and potassium chlorate, manganese dioxide and sulfur dioxide); and the refrigerants and chemical fuels division (ammonium and potassium perchlorate, boron and lithium chemicals).

Although each Western division is headed up by a divisional sales manager, he functions essentially as a product manager. And, the refrigerants divisional manager handles sales on a national basis. District sales offices (Los Angeles, San Francisco and Portland) and managers complete the organization.

Handling of foreign sales remains essentially unchanged in the reorganization; both an English subsidiary, Borax & Chemicals Ltd., and the export department report to the eastern general sales manager.

Working Ways: Both product managers in the East and divisional managers in the West are staff, not line, functions. Although they are responsible for product sales, dissemination of product information, sales forecasting and other tasks, the managers have no direct administrative responsibility for district offices (e.g., salesstaff recruitment).

General sales managers have final responsibility for all sales under their jurisdiction. District sales managers report to the general manager. And to solve the problem of adequate coverage, field salesmen handle all company products.

Happy Mixture: The new organization, says Francis, is a "happy mixture of the old line heavy-chemicals approach with the more complex approach of companies with a diversity of products." Biggest benefit of the blend, according to Francis: the linestaff combination gives AP&C both across-the-board versatility and specialization. District sales people, han-

dling all products, are "jacks-of-alltrades," while Eastern product managers and Western divisional managers are "masters of particular trades."

Although, ostensibly, AP&C appears divisionalized, its sales system does not follow the divisional pattern completely. Divisions don't have separate administrations and sales staffs. That makes for simplicity, low administrative costs.

The company also counts two other advantages from the new organization: new sales districts and product managers can be added with a minimum of difficulty; narrower specialization allows product managers to concentrate more on their specialities, do a better job of using their know-how.

Service Shuffle: New to AP&C this year, too, is a formalized technical sales service section, with both Eastern and Western managers. They report to the general sales managers.

In the past, functions of the new department were performed on a scattered basis by product managers, production and research departments and the general sales managers. Now, the section is formally constituted, is responsible for the collection, assimilation and dissemination of technical information relating to product properties, uses, packaging and applications to present and potential customers, sales, and other company functions.

Besides providing complete customer technical service, the group:

- Establishes product specifications and quality guarantees;
- Provides liaison between sales and production departments on quality control:
- Cooperates with production and market development groups to maintain and develop container specifications:
- Handles labeling and all matters pertaining to product liability;
- Assists in selection of tradenames:
- Processes customer complaints;
- Assists in preparation of technical publicity and advertising;
- Develops and maintains an inquiry follow-up system.

Now completing its shakedown phase, the new sales organization will be fully field-tested this year. In that time, the system should, AP&C hopes, prove its mettle in solving the problems of growth and product diversification.

Announcing ORZAN P...the Orzan that Precipitates!

Here's an emulsifier whose emulsions break at your command! A soluble binder which precipitates on fibers in suspension! A low priced flocculant to remove suspended impurities from solutions!

ORZAN is the registered trademark for a group of surface active lignin sulfonate chemicals derived from wood pulping by Crown Zellerbach Corporation. The basic members of this ORZAN chemical family are:

- · ORZAN A, the ammonium lignin sulfonate.
- · ORZAN S, the sodium lignin sulfonate.

ORZAN P, a spray dried powder, and ORZAN PL-40, its liquid counterpart, are derived from ORZAN A.

Like ORZAN A and S. ORZAN P is a dispersant for slurries of clay or other solids in water. It is an emulsifier or stabilizer for oil-in-water emulsions. It has excellent binding properties.

However, ORZAN P differs from ORZAN A and ORZAN S in that it may be precipitated from solution by the addition of alum. As it precipitates, it forms a floc which clings to fibers or particles present in the system. This property leads to its use as a flocculant to remove suspended particles from solutions.

When precipitated in a pulp slurry, ORZAN P serves as a binder for insulating board and other fibrous products. If a rosin, wax or asphalt emulsion is made with ORZAN P, precipitation will immediately break the emulsion, causing the emulsion particles, as well as the ORZAN P, to deposit upon in a more efficient use of raw materials fibers present in the system.

ORZAN P as a "part time" emulsi- Emulsifier fier, as well as for its own binding effect, is becoming increasingly useful in the manufacture of insulating board.



ORZAN PL-40 precipitating in alum SOME USES FOR ORZAN P

Binder for Fibrous Products In commercial use on softboard made by the wet process, 2% ORZAN P

- 10% increase in transverse strength
- 20% increase in stiffness
- · Substantial increase in water resistance.

Laboratory handsheets have shown transverse strength increases as high as 40% with a 2% addition of ORZAN P. On cylinder machine board, ORZAN P has demonstrated an ability to reduce separation of the plies.

Retention of Fines in Fibrous Mats

A small amount of ORZAN P will assist in the retention of fine pigments, sizing materials and short fibers which water draining from paper machines and board forming wires. This results and a saving to the operator.

ORZAN P will cause many oily materials to form stable emulsions in water. Such emulsions can be broken easily and cleanly by reducing the pH of the system with aluminum sulfate. Some of the materials which have been emulsified with the aid of ORZAN P:

Asphalt	Wax
Rosin Size	Mineral Oil
Tung Oil	Petrolatum
Boiled Linseed Oil	Fatty Acids
Petroleum Ether	

This property of ORZAN P is useful in the application of sizing materials to insulating board, hardboard, or paper.

Stabilizer for Asphalt Emulsions Approximately 1% ORZAN P, used with Vinsol resin, will help Type SS-1 and SS-1h asphalt emulsions to pass the ASTM cement test.

Flocculant

The ability of ORZAN P to help settle fine particles has been demonstrated on a commercial scale in solutions of aluminum sulfate, to remove the acidinsoluble siliceous portion of bauxite ore. It is being used in several kraft paper mills to improve clarification of kraft green liquor.

Other possibilities are in the settling of ore process waters, electro-plating plant wastes, coal wash waters and industrial water and sewage.

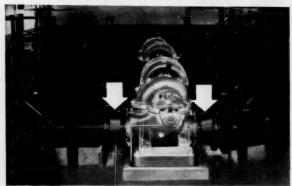
Dispersant

Clay and other slurries can be dispersed with ORZAN P just as with ORZAN might otherwise be lost in the white A or S. Addition of aluminum sulfate will precipitate the ORZAN P and eliminate its dispersing effect. Thus viscosity of the slurry may be first reduced, then increased if desired.

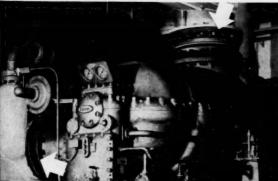




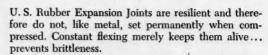
Expanding the Designer's Scope



The flexible rubber expansion joints on the centrifugal pump installations (above) are made by U. S. Rubber. They prevent stresses caused by expansion and contraction.

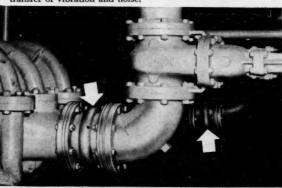


This compressor has U. S. Expansion Joints on the suction and discharge lines. Like all U. S. Joints, these insulate against the transfer of vibration and noise.



- They absorb both axial and lateral deflection far more than metal joints. Greater insulation against vibration and pump noises. No electrolysis, corrosion or erosion.
- Handle pressures from 40 lbs. to 125 lbs.
- The outside diameter of the arch is smaller than on metal joints. (Face-to-face dimensions, even with multiple arches, are smaller.)
- Weight is much less. This, plus the fact that no gasket is needed between flanges (metal joints require gaskets) results in an easier installation lowering the cost.

"U. S." was the first to develop expansion joints. They are at work in every kind of industry, prolonging the life of equipment in pressure or vacuum pipe systems. Some are still in service, after 30 years of operation. Obtainable at any of the 28 "U. S." District Sales Offices, or write us at Rockefeller Center, New York 20, N. Y. In Canada, Dominion Rubber Co., Ltd.



Piping equipped with U.S. Expansion Joint to compensate for any misalignment caused by load stresses, wearing of parts or settling of building.





Mechanical Goods Division

United States Rubber

Technology

Newsletter

CHEMICAL WEEK July 27, 1957 Cyclosteel will get a small-scale pilot-plant tryout in 1957. So says the British Iron and Steel Assn. in its report for 1956. It says that exploratory work to obtain data for building the pilot unit for the cyclosteel process (CW, Jan. 26, p. 94) has been completed.

Presently, the idea is to use a two-stage process—one in which the ore is preheated and prereduced, one in which it is reduced to the metal and separated.

A shower furnace was studied for the first step. But temperatures in the furnace were high and refractory attack severe. A combustion chamber for burning powdered ores and fuel also showed up severe conditions on refractories. This is being replaced by a cyclonic reactor. The prereduction stage will be carried out using fluidized-bed techniques.

A self-sustaining nitric acid plant will be built for Atlas Powder by Chemical and Industrial Corp. (Cincinnati). The energy released from burning ammonia to nitric acid will be recovered to furnish full power requirements for the unit. Once the plant has started up and reaches designed capacity, it should require no other source of energy. It will be the first one of its kind ever built in this country, according to Chemical and Industrial Corp.

The nitric unit is a part of Atlas's 4-million replacement program at Atlas, Mo. It's putting in new ammonium nitrate facilities there, too (see Business Newsletter, p. 17).

Firestone is building quite a literature on its Coral rubber process. In addition to the recently published Australian patent applications (CW Technology Newsletter, June 15), Firestone has received patents in Italy (559,160; 559,704; 560,200; 561,343 and 561,529) and in Spain (230,655; 231,396 and 231,397). And it has filed more than 70 applications in the U. S. and foreign countries. They involve mass and solution polymerization techniques.

More on semiconductors. Texas Research Associates has signed a contract to handle the design and development on "solions" (see p. 34) for National Carbon.

Any sizable production or utilization of the solions, however, is believed to be a couple of years away.

The first electric power from the Sodium Reactor Experiment (SRE)—Santa Suana Mountains, Calif.—was produced last week. An AEC reactor built by Atomics International, it generated heat purchased by Southern California Edison. The latter has set up equipment for inter-

Technology Newsletter

(Continued)

mittent generation alongside the reactor and will distribute it over its regular lines.

SRE is designed to operate at full power (20,000 kw.) late this year. When it does, Southern Edison will generate about 6,500 kw. of electricity. In the recent test, the generator operated at 1,000 kw.

Here's a new twist in titanium utilization. Electromet is now turning out master alloy formulations that permit the production of titanium-based alloys without other additives. For instance, one that contains vanadium and aluminum can be added to titanium sponge to make a titanium alloy containing 6% aluminum and 4% vanadium. All told, the company has nine such formulations.

Advantages for the melter, as Electromet sees it: he can speed up formulation and mixing, eliminate raw material storage, use semi-skilled labor.

A new synthesis of pentafluorobenzene may facilitate the study of other aromatic fluorine compounds, synthesis of which has heretofore been impossible. The new synthesis was worked up by R. Stevens and J. C. Tatlow, of the University of Birmingham, in England. They first fluorinated benzene to get a polyfluorocyclohexane mixture. They extracted an octafluorine derivative from the mixture, subjected it to dehydrofluorination.

A preliminary study of pentafluorobenzene reveals that it reacts readily with nucleophilic reagents. It reacts with oleum to form a sulfonic acid that forms "somewhat surface-active" metallic salts.

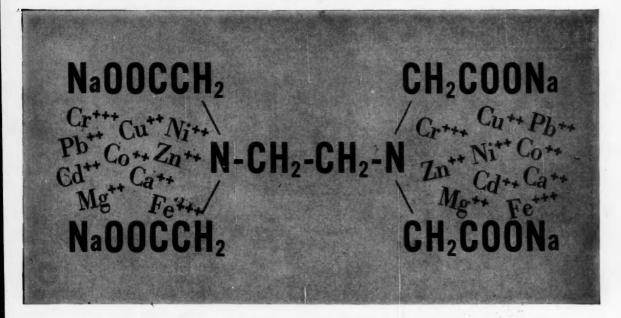
Vinyl pyrrolidone may find itself with some new competition: vinyl oxazolidone, reported in the current (July) issue of the *Journal of Organic Chemistry*, vol. 22. The work was done at Cyanamid's Stamford labs by Erhart Drechsel (who now, incidentally, is with Escambia Chemical).

The newcomer is structurally the same as the pyrrolidone except that a methylene group in the ring (2-position) is replaced by an oxygen atom. And although the two belong to different chemical families and have different chemical and physical properties, both readily form polymers and copolymers; homopolymers of both are water-soluble and are complexing agents.

Cyanamid is thought to be not actively developing the compound. But it has received a patent (U. S. 2,786,043) on the use of a homopolymer for plasticizing a polyacrylonitrile.

A new battery of mercury cells has been installed by Dow at its Pittsburg, Calif., plant. The new cells are of Dow's own design, will employ germanium rectifiers. They'll just about double the plant's capacity of high-purity (50%) caustic potash.

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ENGINEERING

Aldol processing tricks:

- Close control of reactant proportion and mixing
- * Adiabatic operation of exothermic reaction
- Selective, multistep recovery

Celanese parlays them into . . .

A Growing Team of Polyols

At Bishop, Tex., this week, Celanese is putting the finishing touches on its new trimethylolpropane (TMP) plant -heart of the company's expanding aldol-polyol activities. Due onstream early this fall, the plant will have a capacity well in excess of 10 million lbs./year of TMP and related products. Although Celanese hasn't described the key processes of its improved aldol operation, some clues to how it deals with the tricky reactions have been disclosed in a recent patent (U.S. 2,790,837) covering production of trimethylolethane-a close relative of TMP.

When Celanese started up production in a large semiworks plant last year (CW, June 9, '56, p. 116), it was still investigating the advisability of turning out TME as a companion product. Since that time, however, the company has concentrated on TMP, which, it reports, is winning wide acceptance among producers of urethane foams (both rigid and flexible types) and coatings, alkyds, synthetic drying oils and lubricants, plasticizers and surface-active agents. As a result, Celanese has shelved plans for TME production—temporarily, at least.

Reaction, Recovery: The aldol process of making the polyols involves the reaction of formaldehyde with a higher aldehyde in alkaline solution. In TME production, propionaldehyde is used; for TMP, butyraldehyde would be the higher aldehyde. The tricks employed to obtain the desired polyol in good yield lie in the special technique of carrying out the reaction, in a series of complex recovery steps that maximize purity, minimize product loss.

The key to reaction control, according to the patent, is the proportioning and method of mixing the starting materials. For the production of TME, it's recommended that formaldehyde be supplied to the mixing zone of the reactor in substantial excess—preferably 8-12 moles of formaldehyde per mole of propionaldehyde. The aldehydes should be blended together before mixing with the alkaline starting material to minimize undesirable autocondensation, other side reactions.

The alkali-metal hydroxide (NaOH was used by Celanese) is also supplied in excess of theoretical requirements. Recommended ratio: 1.1-1.2 moles of sodium hydroxide per mole of propionaldehyde. Too large an excess (more than about 1.3 moles), however, must be guarded against or it may promote side reactions, complicate isolation of the reaction product.

Temperature Control: Because the reactants start to react vigorously on mixing, the reactor must be designed to blend them rapidly into a homogenous mixture. From the mixing zone, the reactants pass in a continuous stream into the reaction zone, where they remain until the reaction is substantially complete. Required features of the reaction zone: baffled construction to prevent back-mixing of the reactant stream, temperature control to maintain the materials within an optimum range of 45-50 C.

By proper adjustment of the concentration of the aqueous materials charged to the reactor, the high heat capacity of the water present in the system helps to control the temperature by absorbing much of the exothermic heat of reaction. The patent recommends a ratio of 23-28 parts water per part of propionaldehyde (reaction mixture is 70-80% water by weight), an initial reactant temperature of 20-32 C. External heating or cooling of the reactor may be used if needed, but adiabatic operation is preferred

Four-Step Recovery: To prevent undesired side reactions during subsequent processing steps, the mixture leaving the reactor at a pH about 9.8-10.5 is first treated with acid (e.g., formic, acetic) to reduce the pH to about 6-7. The mixture is then distilled at 135 C, 15-20 psig., for recovery of excess aqueous formaldehyde. The use of pressure permits recovery of formaldehyde in concentration suitable for recycle to the process.

The separation of crystalline trimethylolethane from the sodium formate remaining in the mixture is a more difficult operation, may be effected by either of two methods cited in the patent.

The preferred technique: a multiphase method in which the TME is dissolved selectively in an organic solvent (e.g., a lower aliphatic alcohol such as n-propanol or isopropanol). The addition of solvent to the mixture produces a three-phase system of TME in the organic phase, sodium formate in the water phase and a crystalline sodium formate phase. By drawing off the solvent phase and recovering solvent by distillation, TME can be recovered by crystallization from the residue.

An alternate technique—the concentration method-calls for concentration of the formaldehyde-free mixture by evaporation to a total dissolved solids content of 60-70%. The resulting hot, concentrated solution may then be cooled to about 20 C to precipitate crystals of TME. Separation of the crystalline product by filtration or centrifugation yields a "first crop" of about 60% of the TME produced. Additional crops can be obtained from further concentration of the mother liquor, but each successive crop contains more sodium formate as a contaminant. Final recovery of TME from the crude crystalline product requires selective dissolution in a suitable lower alcohol, followed by any convenient method of crystal-



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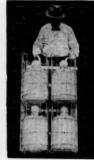
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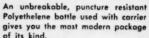
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lizing the product out of the resulting solution.

A third technique suggested by the patent: a combination of the concentration method to recover about half of the product and the multiphase method to strip the remaining TME from the concentrated mother liquor.

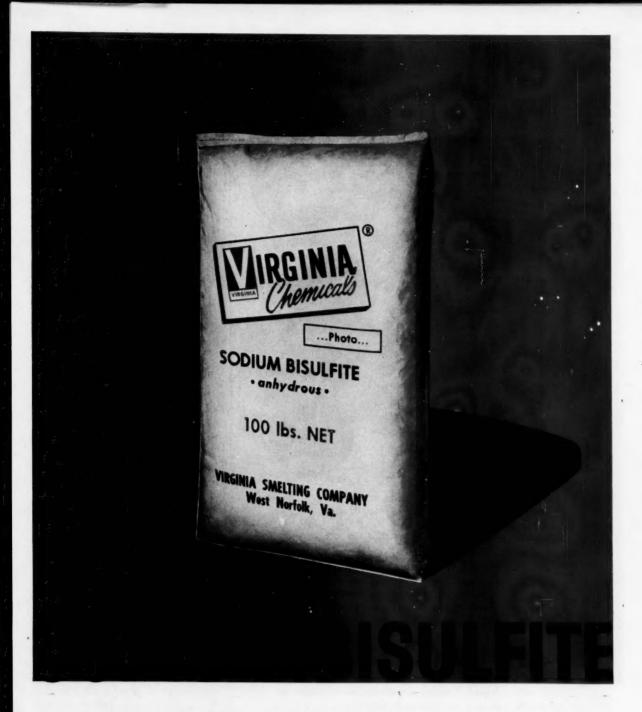
Polyol Prospects: Although Celanese is not now planning to produce TME, it's a good bet that the reaction and recovery techniques described in the patent will be used—with appropriate modifications—in its TMP plant. Celanese is basic in raw materials for both TME and TMP, but feels that the latter has brighter commercial prospects.

Economics of the process have lived up to expectations, says the company; TMP from the new plant will be priced competitively with other commercially available polyols. In addition to TMP, the plant will also turn out anhydroenneaheptitol and 3-methoxybutanol.

But, TMP will continue to be the mainstay of the polyol team. Celanese believes the product will continue to win acceptance in a variety of applications, particularly in the urethanes. And if urethane progress (CW, April 27, p. 84) is any indication, TMP should have a wide field from which to choose.

Sulfuric Acid: High-purity sulfuric acid can be obtained from coke-oven gas at a cost of \$6.30/ton, according to Concordia Bergbau AG. (Oberhausen, Germany). Coke-oven gas is first washed with ammonia in an aluminum tower to recover 80% of the hydrogen sulfide present. Oxidation of hydrogen sulfide in the presence of a vanadium catalyst gives a 99.2% yield of sulfur trioxide, which is treated by condensation and pressure filtration to produce 99.9% pure sulfuric acid.

Transistor Bonding: Soft metal leads can be firmly bonded to clean, single-crystal semiconductor surfaces by thermocompression bonding, a flux-less technique developed at Bell Telephone Labs. Two variations of the method are feasible: pressing the metal against the heated semiconductor with a heated wedge or point, and butting the balled end of a wire against the heated semiconductor for five seconds to 10 minutes, at 5,000-10,000 psi., 200-300C.



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Injector Nitration

In the production of explosives, safety precautions that minimize the risk to operators must often be gained at the expense of processing simplicity. But with the development of a specially engineered injection system, Nitroglycerine Aktiebolaget* (Gyttorp, Sweden) has introduced a continuous nitration process that, it says, not only reduces explosion hazards, but also cuts the cost of nitroglycerine production facilities.

Its previous nitration of glycerol or glycol required the use of a relatively large buffer volume of spent nitration acid in which the explosive ester could be emulsified. And, though this technique effectively reduced the danger during the nitration step, it involved the handling of relatively large quantities of explosive in the subsequent separation of the ester.

Nitration by injection, on the other hand, reduces the holdup of the product in the nitration stage, transfers it as a nonexplosive emulsion to the separator. What's more, says NA, risk of adding the wrong quantity of glycerol-an error that could lead to decomposition or a possible explosion is practically eliminated. Here's how the injector system works:

A mixture of nitrating acid and spent acid (27.5% HNO3, 61.0% H₂SO₄, 9.5% H₂O, 2.0% organic product) is delivered to the injector from a storage tank maintained at a pressure of 50 psi. Glycerol or a mixture of glycerol and glycol (NA normally uses a mixture of equal parts) is charged to a storage tank, heated to 50 C. From here it flows to a suction tank connected to the vacuum line of the injector.

To start nitration, an air-inlet valve on the injector is closed, acid flow through the unit sucks the glycerol into the mixing zone. The special design of the injector promotes vigorous, instantaneous mixing of acid and glycerol phases. Nitrating temperature is closely controlled to 40-45 C above that of the incoming acid; a fused contact device shuts the reaction down automatically if it exceeds 54 C.

From the nitration unit, the acidnitroglycerine emulsion flows to a centrifugal separator located in an-

*The birthplace of the nitroglycerine industry Nitroglycerine Aktiebolaget was founded in 1864 by Alfred Nobel.



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other building. Here the emulsion is separated at the rate of 800 gal./hour. Part of the spent acid is retained for recycle to the nitration plant; the remainder is allowed to separate to permit recovery of the small amount of nitroglycerine (about 0.1%) remaining in emulsion.

A water injection system continuously removes the explosive oil effluent from the separator to limit holdup of product to a maximum of about 10 lbs. in this stage. The resulting water emulsion of nitroglycerine is transported to a wash-and-weigh house in which conventional handling operations are employed.

Automatic Safety: Biggest advantage of the injection system, NA points out, is that very small quantities of free nitroglycerine are present during the manufacturing process. This eliminates the need for protective mounds around the charging section



Radioactive Gold at Sutter's Mill

These "prospectors" made sure that they'd find gold at the site of historic Sutter's Mill by "seeding" the American River a mile upstream. The twist is that this is radioactive gold (Au¹⁹⁸) used as part of a new method to measure water flow rates. Developed and made available under license by California Research Corp. (San Francisco), the new "total count"

method consists of measuring the flow of gold with a Geiger counter (at end of fish pole in picture) and calculating the water flow rate. This procedure is reported to have reduced the time necessary for such a measurement in areas not equipped with regular gauging stations from several days to less than two hours. And there's no radiation hazard; half-life is only 2.7 days,

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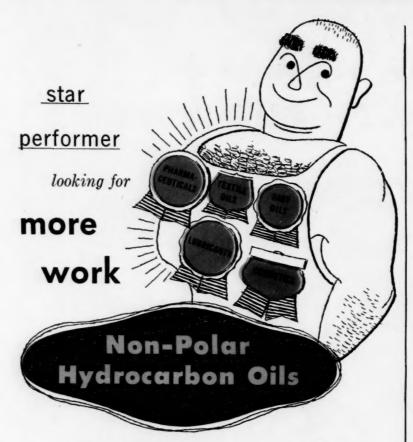
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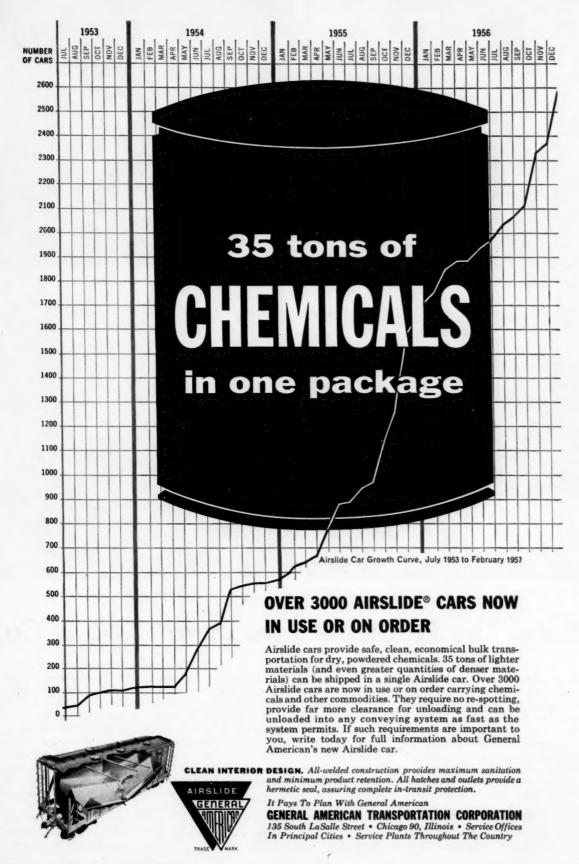
of the plant; a concrete wall suffices to isolate the nitration equipment from the control area.

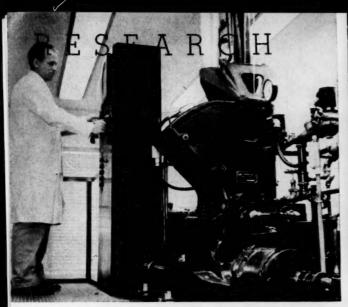
Prevention of incorrect mixing is another inherent advantage of the injector. Since acid flow through the unit is required to draw glycerol into the system, a decrease in the acid flow causes a more than proportionate drop in glycerol supply (glycerol is cut off completely if acid falls to one-third normal flow rate).

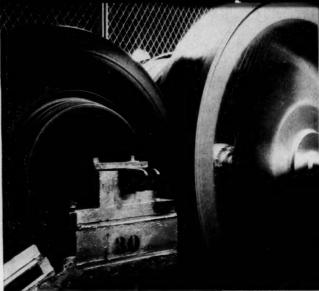
From the standpoint of equipment costs, says NA, the injector installation is cheaper to build and operate than the mechanically agitated nitration reactors previously used. Lack of movable parts simplifies routine maintenance, also insures reliable operation. Basic 1650-lb./hour unit (the size now running at Gyttorp) may be scaled up to double capacity or larger, or units may be installed in multiple without increasing control staff requirements.

Payoff in Safety: Yields obtained from injection nitration are in the range of 93.9-94.5% of theoretical, says NA, about the same as those produced by the older continuous nitration methods. But the real bonus—not measurable in percent or dollars and cents—is the higher degree of safety that the injector brings to a naturally hazardous process.

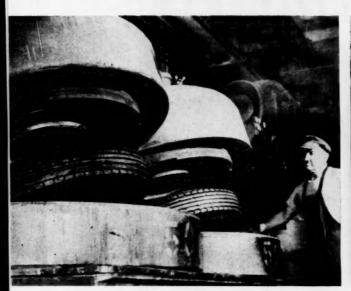
Cotton Bleaching: A new process for bleaching cotton will soon be offered to the textile industry on a royalty-free basis by Solvay Process Division of Allied Chemical & Dye Corp. Now in successful, full-scale commercial operation, the "activated hydrogen peroxide" process involves prebleaching with specially prepared hypochlorite (after caustic purification) followed, without washing, by bleaching with reduced quantities of hydrogen peroxide and other chemicals for a shorter period of time than that used in the conventional method. In addition to reduced bleaching costs, the process is said to produce higher brightness, brightness retention, purity, absorbency, dyeability and reduced ash and metals content without harm to yarn or cloth. In addition, says Solvay, moderately hard water can be used for washing when using the new procedure, with no reduction of absorbency. Such reduction often occurs in normal peroxide bleaching.

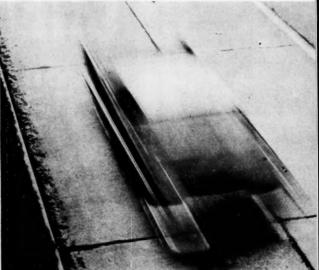






PROBLEMS SOLVED: Chemical additives give butyl increased resilience and durability.





STILL TO COME: Faster curing agents, less "rolling resistance" are problems still to be solved.

Butyl Tire Problems: Two Down, Two to Go

When Esso Research and Engineering (Linden, N.J.) unveiled its new butyl tire last fall (CW, Oct. 6, '56, p. 72), it didn't go into much detail about the chemistry behind the newcomer. Now the tire's test marketing is going well and Esso is talking details with all major tire manufacturers. What's more, Esso is researching a new butyl-like polymer (called MD-551, its exact structure is unknown) that may prove a threat to natural rubber. Natural rubber, of course, still shares raw-material honors with GR-S (butadiene-styrene) in the \$2.6-billion/

year tire industry.

Despite Esso's efforts to indoctrinate them, however, not all tire makers are convinced that butyl will make appreciable inroads on GR-S. For one thing, Esso's dominant position in butyl-rubber production (by subsidiaries Enjay and Humble Oil) alone is causing the rubber men to step up research on GR-S, which is in broader supply.*

And, they argue, butyl tires still have shortcomings that GR-S tires do

*Rubber companies produced most of the 740,000 tons of GR-S consumed last year. Tires accounted for 489,000 tons.

not. Goodrich, for example, has been experimenting with butyl tires for five years, reports it has observed "good, but not excellent" abrasion and wear qualities. While conceding that butyl provides a more comfortable ride—because of its noiseless, shock-absorbing properties — Goodrich questions whether this, without improved wear-resistance, is enough to justify the premium price that butyl tires are expected to command.

Donald Buckley, who heads up Esso's butyl research, thinks butyl may already be tough enough, reports that



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RESEARCH

butyl tires on Esso's Linden fleet of test cars are wearing 7% longer than GR-S. Buckley also thinks butyl's better ozone resistance, traction, absence of "tire thump" (caused, some believe, by a slight leveling of parked tire surfaces) gives butyl an edge over GR-S.

Two butyl tire failings, however, are getting lots of research. One of these is the power-sapping "rolling resistance" or drag of butyl tires, especially at low starting temperatures. It takes a few miles of travel before the power required to drive butyl-tired wheels is as low as that for GR-S.

Esso explains that at high speeds, butyl tires may take less power than GR-S, tending to wash out any differences between the two rubbers in power consumption. New additives could eliminate the problem altogether.

Another difficulty is butyl's slow rate of cure, which raises the cost of making the tires. Esso has made progress here, needs to make more. Butyl rubber— a copolymer of isobutylene (98%) and isoprene (2%)—needs ultra-accelerators to vulcanize properly. Esso uses tellurac (tellurium diethyl dithiocarbamate) as a vulcanizing agent, hedges its tendency to cause scorching (overcuring) by adding benzothiazyl disulfide.

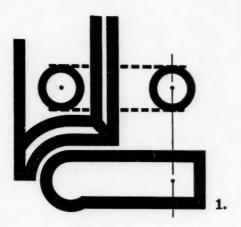
The chief obstacle to butyl tires in the past has been the need to develop a butyl latex suitable for tire cord treating. Esso is developing better aqueous butyl latices. One of these, named ENJ-B-12, is now being introduced.

In a typical formulation, the latex (40% solids) is mixed with resorcinol (2.2% by weight), 37% formaldehyde (3.5% by weight), and deionized water.

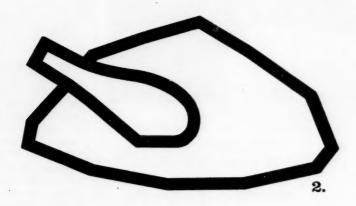
Even more fundamental than this was Esso's first chore—to increase the resilience of butyl (to make it satisfactory for tires) without sacrificing the desirable properties of the polymer. To achieve this, the butyl stock is milled in a Banbury at 400-440 F for 20 minutes along with pigment (e.g., zinc oxide) and a chemical to promote polymer-pigment interaction.

So far, Esso has found N-nitroso-N-methyl-p-nitrosoaniline (tradenamed Elastopar) its best chemical promoter.

In its research to find a suitable promoter, Esso has observed that all the compounds that produced the desired interaction were bifunctional,



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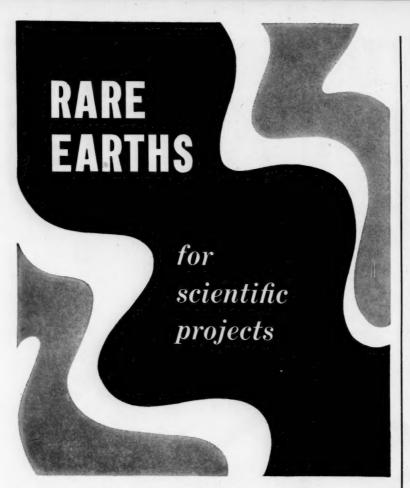
If you have a problem which might be solved by a high quality organic chemical, think of Pfizer first. Contact Dept. WP, Chas. Pfizer & Co., Inc., Chemical Sales Division, 630 Flushing Ave., Brooklyn 6, N.Y.

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RESEARCH

para-substituted nitroso compounds. But they varied greatly in effectiveness.

Another important piece of research leading to the new tires has been done on tackifiers—materials to help butyl rubber plies to adhere to each other as the tire is being built.

Tackiness is inherent in natural and GR-S rubber, making tackifiers unnecessary in constructing tires from them. Esso, after much sifting, turned up a phenol-formaldehyde resin (Amberol ST-137X) that it says is particularly useful in butyl for generating surface tack.

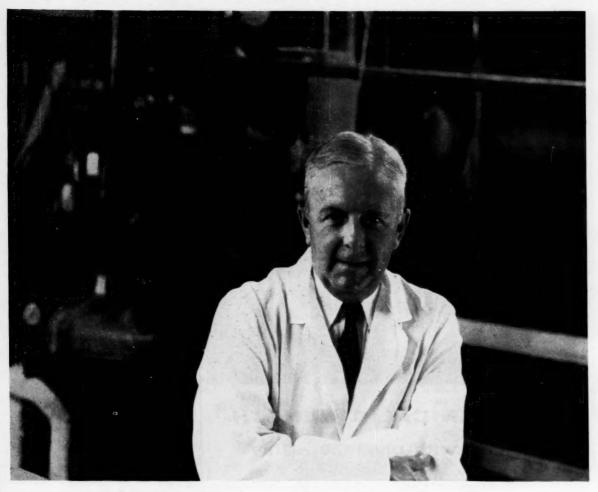
Newest Butyl: Pilot-plant quantities of Esso's newest isoolefin-diolefin polymer, MD-551, are a trickle Esso hopes will swell to a torrent. The new rubber vulcanizes rapidly, doesn't require sulfur to vulcanize, resists heat and flexing and is compatible with other rubbers, including natural rubber and GR-S.

The last-named property might very well prove the most important. Butyl now used for tires is incompatible with GR-S, poses a real problem when both types of rubber must be processed in the same equipment.

MD-551 not only reduces this contamination problem but offers a real commercial opportunity in combination with other rubbers. Esso has made a composite tubeless tire, using MD-551 as the liner. Previous butyls could not be made to adhere sufficiently for this purpose.

Esso's Buckley calls the properties of butyl polymers and the tires made therefrom "an invitation to the ingenuity of the tire industry and tire technologists." He points out that "a new material enters an established technology only because it has some new qualities to offer. To maximize these qualities in the finished product, it is almost invariably necessary to apply something more than established techniques and procedures." While the concomitant problems, in this case, have been tackled only on a pilot-plant scale, Esso has high hopes for a scaleup of butyl tire production in the not-too-distant future.

Meanwhile, the major tire makers are continuing to include butyl in their planning. Besides Armstrong Tire Co. (West Haven, Conn.), which is making the new tire for trial commercial markets, and U. S. Rubber (which makes Esso's Atlas tires), butyl-re-



This man runs the only glycol dimethyl ether plant in U.S.

Clayton Parcels is in charge of Ansul's glycol dimethyl ether plant, the only one in the United States. His plant is running at full capacity because these unique solvents are playing a vital role in many new chemical processes.

Take the exciting things being done with metal hydrides, for instance. Sodium borohydride required a non-reactive solvent, so Ansul Ether 141 (dimethyl ether of diethylene glycol) was suggested. Now sodium borohydride can be used effectively as a reducing

agent for aldehydes, ketones, acid chlorides, acid anhydrides—and most recently—in ester reductions.

Mr. Parcels would like to send you our new 27-page technical bulletin on the solubility and stability of commercially available hydrides in Ansul glycol dimethyl ethers. For that matter, he'd be happy to talk with you about any chemical problems that might require a specialized solvent. Write Clayton Parcels, ANSUL CHEMICAL COMPANY, MARINETTE, WISCONSIN.



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... with phenolic resins

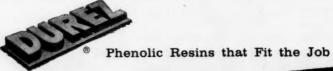
No old-fashioned forces of nature prevent the newest thing in croquet balls from splitting or chipping under freeswinging mallet blows.

What does then? It's a material with inviting possibilities for all who seek a binding, impregnating, coating, or sealing agent combining mechanical strength with other wanted attributes... Durez phenolic resins.

Under heat and pressure, these resins convert granulated wood-often obtained from waste-into play equipment, chair seats and backs, desk tops and other products both shaped and flat. The reconstructed wood is a dense, hard mass having no directional grain, no ends to chip or splinter. The Durez thermosetting resin also makes it waterproof and weatherproof and provides a perfect base for decorative and architectural finishes.

Resins like these that are opening up a new era in the wood-working industry could well have a problem-solving part in your operations. With their mechanical strength they combine electrical nonconductivity and resistance to heat, cold, and humidity. They are unaffected by many acids and mild alkalies.

Our long experience in research and production is at your service. For an allover view of what is being accomplished with phenolic resins, let us send you our bulletin, "Durez Industrial Resins."



DUREZ PLASTICS DIVISION

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Export Agent: Omni Products Corp., 460 Fourth Avenue, New York 16, New York

RESEARCH

searching companies include Cooper, Dayton, Dunlop, Firestone, Gates, Goodrich, Goodyear, Lee, Mansfield, and Seiberling. Together, these firms turn out more than 95% of the tires for the country's 60 million motor vehicles.

There's always a chance that butyl's low cost (23¢/lb. vs. 30-35¢/lb. for natural rubber) may upset the scales in its favor, provided butyl tires catch hold commercially. Neither natural rubber (of which 364,000 tons went into tires last year) nor its synthetic version (e.g., Firestone's Coral and Goodyear's Natsyn) have properties in common with older butyls. But the new MD-551 modified butyl is distinct competition, especially in blends to replace natural rubber.

The total butyl production last year (60,000 tons) doesn't vet qualify the polymer as an abundant replacement for its established competition in tires.

But U. S. butyl capacity already is big enough to handle any immediate upsurge in demand. Enjay's Baton Rouge plant is rated at 90,000 tons. Humble Oil's Baytown, Tex., plant at 26,000 tons. In addition, Petroleum Chemicals Inc.-jointly owned by Cities Service and Continental Oil-is building a 30,000-ton butyl plant at Lake Charles, La., expects it to be onstream in 1959. Goodrich-Gulf also has a license to make butyl, hasn't yet revealed its plans.

A shifting butyl market picture is already discernible. Of the 50,000 tons of butyl consumed last year, 80% went into automotive products, mostly all for inner tubes. By 1960, many observers believe butyl inner tubes will no longer account for the lion's share because of the spurt in tubelesstire production. If butyl research continues at its present pace, 10% of the tires made by 1960 may have butyl carcasses.

EXPANSION

Aluminum Company of Canada Ltd. (Kingston, Ont.), is constructing a \$500,000-addition to its present research facilities, expects it to be ready this September.

Florida State University (Tallahassee, Fla.) will spend some of its recently appropriated nuclear research funds (CW Technology Newsletter, June 8) on a 10-million-volt Van de Graaff tandem accelerator, one of the

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Stable to acids and alkalies even in boiling solutions, Versene 100 inactivates calcium, magnesium and other metal ions. It will not revert to an inactive form. Versene 100 ties up these contaminants completely within an inner ring structure . . . actually forms a new, harmless compound with hardness and trace metals in solution. Applications in textile and rubber processing, in chemical purification and boiler descaling, in soaps, syndets, all types

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booklet would quickly refer you to an iron-specialty agent such as Versenol® 120. A liquid, Versenol 120 complexes both ferrous and ferric iron over a wide pH range.

Fact is, you'll find this booklet's discussion of the chemistry of chelation, Dow chelating agents and their uses helpful in correcting any metal ion problem. With the Versene and Versenol products practically every metal ion in any solution can be chelated. Contact your nearest Dow sales office for "Keys to Chelation". Or write us direct. The DOW CHEMICAL COMPANY, Midland, Michigan, Dept.CA 1313RG.

*Trisodium salt of N-hydroxyethylethylenediaminetriacetic acid

YOU CAN DEPEND ON DOW



The Atomic Age is an age of metals—old metals that find new uses in new surroundings-rare and little-known metals.

Old or new, rare in occurrence or use, these metals may be light, heavy, hard or soft. Their use as fuels, or in the structure or controls of nuclear reactors will vastly increase the use of all our metal resources

Vitro is at the heart of metals development for the Atomic Age, both in new processes and uses for old metals, and the mining and refining of new. rare metals. Through its divisions and associated companies, Vitro mines and refines fissile uranium and fertile thorium. Through its research and development activities, Vitro is attacking the production of old, known metals like manganese and boron by new and unconventional processes. New metals like columbium and tantalum are being recovered and rare earth metals like europium, gadolinium, yttrium and samarium are being mined and recovered.

In these activities, Vitro geologists work as a team with Vitro scientists and engineers to seek new deposits of these metals-and to find new means to coax them from obscurity into profitable use in the Atomic Age.



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RESEARCH

first of its kind. High Voltage Engineering Corporation (Burlington, Mass.) will build the accelerator for installation late in 1959.

· Westinghouse Electric Corp. (Pittsburgh) has established a reactor evaluation center at Yukon, Pa., "to check out atomic reactor calculations and the value of various types of control rods in prototype cores for power reactors." The 20,000-kw. reactor, to be completed there in late 1958, will include closed-circuit television as an observation tool and safety device.

• Metal Thermit Corp. (New York) has begun a long-range chemical research program to develop commercially feasible production methods for metals. Chemical-metallurgical and electrochemical methods now used will be studied for further value in the purification of chromium, columbium, molybdenum, tantalum, tungsten, titanium, zirconium and hafnium.

 Washington University Louis) will construct a new laboratory for research in cellular and molecular biology, expects it to be ready next spring. Costs are being borne by the Anheuser-Busch Charitable Trust and the National Institutes of Health.

PRODUCTS

Aluminum Formate: Available now in powder form from Aceto Chemical Co. (Flushing, N. Y.), it offers greater flexibility in making concentrated solutions, is cheaper to ship, store, and handle than its solution predecessor.

Inhibitor: Lungworm Imperial Chemical Industries Ltd. (Great Britain), has developed Helmox, reportedly a cure for previously incurable lungworm in livestock. Living and breeding in the air passages of cattle, lungworm causes \$8,500,000 annual loss in England.

Iron Drug: Reportedly the first effective drug of its kind, an iron-dextran complex named Imferon is now offered for intramuscular use by Lakeside Laboratories (Milwaukee, Wis.). It is intended for treatment of iron-deficiency anemia.

Lakeside will market Imferon in the U.S. under a licensing agreement with Benger Laboratories, Ltd. (Chesire, England), the firm that developed the drug. Imferon is said to be especially valuable in treating infant anemia.

THE MAN WITH THE



MULTIWALL PLAN



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UNION
PACKAGING SPECIALIST
DON DEININGER

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Multiwall
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*8 per M
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specifications
review

A Chemical Company, already using 43 different

sizes and types of Multiwalls, planned to add new products to its line. Union Packaging Specialist Don Deininger recommended a simplification of Multiwall specifications and inventory. Union prepared a Specifications Manual for the manufacturer, also simplified, unified and modernized his bag designs.

Results: user reported: (1) Union's recommendations for re-designing bag sizes and constructions in some instances saved as much as \$8 per M.

(2) The new Specifications book enabled the cust-

omer to order bags more easily and accurately. It also simplified his inventory control.

(3) The new designs established a visual relationship between his family of products, enabled his sales force to do a better merchandising job.

This is a typical example of Union's 5-Point Multiwall Plan

in action. Perhaps it can produce gains in your own Multiwall packaging operation. Write for additional information.

Union Multiwall Recommendations are based on this 5-point Packaging Efficiency Plan



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- . EQUIPMENT
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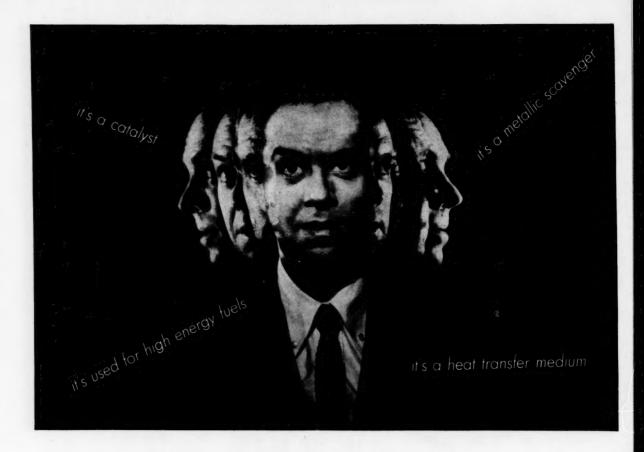
Better Multiwall performance through better



UNION'S PACKAGE ENGINEERING DEPARTMENT will study your Multiwall bagging methods and equipment and make appropriate recommendations, regardless of the brand of Multiwalls you are now using.

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It's now being used as a catalyst for precise control in polymerization and organic chemical reductions. It's potentially the most effective and efficient medium for any high temperature exchange system... with a molten range of 179°C.to 1317°C.and a very high specific heat. Because it reacts with so many gases to form stable compounds, and absorbs such large volumes of gas, lithium is an ideal metallic scavenger, economically deoxidizing, desulfurizing, and degasifying metals, while increasing conductivity.

At the same time an exciting new chapter of lithium is being written in the atomic energy field. Having two isotopes with almost opposite characteristics, lithium becomes potentially useful in nuclear applications. And with its derivatives, lithium also shows great promise in the production of high energy fuels.

These are just a few of the better known applications for lithium metal . . . all relatively new. That's why chances are that you, too, will be using this lightest of all metals in the next five years . . . in research, in production, or in the manufacture of your product. Foote's vast amount of technical data, backing up its production of 99.8% lithium metal is ready to help you get there faster—maybe first. Our Data Bulletin *Lithium Metal* is a good start. Your copy is awaiting your request at the Technical Literature Department, Foote Mineral Company, 420 Eighteen West Chelten Building, Philadelphia 44, Pa.



RESEARCH LABORATORIES: Berwyn, Pa.

PLANTS: Cold River, N.H.; Exton, Pa.; Kings Mountain, N.C.; Knoxville, Tenn.; Sunbright, Va.

LITHIUM METAL, CHEMICALS, MINERALS . STRONTIUM CHEMICALS . ELECTROLYTIC MANGANESE METAL . WELDING GRADE FERRO ALLOYS . STEEL ADDITIVES . COMMERCIAL MINERALS AND ORES . ZIRCONIUM, TITANIUM, HAFNIUM (IODIDE PROCESS)

Market Newsletter

CHEMICAL WEEK July 27, 1957

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More low-pressure polyethylene will be hitting the market—probably within a couple of weeks. Latest source: Hercules Powder's 30-million-lbs./year plant at Parlin, N.J. The installation—poised at ready for some time (CW, June 29, p. 28)—starts getting raw material ethylene this month from Esso Standard Oil's nearby Linden plant.

The Hercules plant will be the third in the U.S. to turn out low-pressure polyethylene, will boost total U.S. capacity for the material to some 180 million lbs./year. Big difference between the New Jersey installation and those of earlier producers in Texas (Phillips Petroleum and Celanese) is that the former is the first full-scale unit in the country utilizing the Ziegler process.

Incidentally, Koppers' Woodbridge, N.J., plant (also rated at 30 million lbs./year) was scheduled to go into operation about now, but won't until late this year or very early in '58. When it and other low-pressure plants now under construction [including Union Carbide's Seadrift, Tex., and Institute, W. Va., plants (CW, Jan 26, p. 82)] are onstream, U. S. capacity will total about 380 million lbs./year. Indicative of the low-pressure material's hot prospects is the fact that by '60 capacity may well come close to 600 million lbs./year.

A king-size price cut in blackstrap molasses points up one good bet—despite the dominant position held by synthetic in the industrial alcohol market, fermentation material can't be counted out.

The molasses price reduction, bringing the tag down to $10\frac{1}{4} \frac{\phi}{/}$ gal., f.o.b. Havana, is part of a deal between Cuban blackstrap producers and Publicker (the only fermentation alcohol maker left in the field). The move pressured New Orleans and New York market prices down $\frac{1}{2} \frac{\phi}{/}$ and $\frac{1}{2} \frac{\phi}{/}$ gal., respectively.

Although all the details haven't yet been worked out, the U. S. firm will get some 60 million gal. of molasses this year and about 100 million in '58. (First shipment arrived in Philadelphia earlier this week.)

The alcohol market has been rather tight of late but the anticipated additional fermentation material will definitely contribute to an easing; Publicker will, for the most part, channel its material into domestic outlets, though there's a slight chance some will wind up abroad where it's also in short supply (CW Market Newsletter, July 20).

Another oil company joins the roster of chemical producers—and benzene-toluene-xylene availability gets an earlier-reported boost (CW, Dec. 1, '56, p. 100). Delhi-Taylor Oil's new installation (a combination UOP Platformer-Udex unit put up by Treco at Corpus Christi, Tex.)

Market Newsletter

(Continued)

went onstream last week. Capacity: about 45 million gal./year of aromatics.

Production and sales will be handled by Delhi-Taylor's recently formed Chemical Division with plant headquarters at Corpus Christi and main sales offices in New York.

Two more expansions in Kentucky underline the growing importance of the South as a chemical-producing area. Stauffer has just completed a new petrochemical unit at Louisville, and production is now under way at General Aniline & Film's new surfactant plant at Calvert City.

Stauffer's new chlorinated solvents installation ups production potential for chloroform, methylene chloride, carbon tet and hydrogen chloride. In addition to the plant, the company has installed extensive dock facilities to handle chlorine barged in from producers on the Ohio or Mississippi rivers.

General Aniline's "multimillion-pound surfactant facility," now turning out alkyl-phenols and Igepal and Alipal types of surface-active agents, is built on the 55-acre tract where the company's high-pressure acetylene chemicals plant is located. (The latter plant, though hobbled by production difficulties for some time, may be producing satisfactorily in the next couple of months or so.)

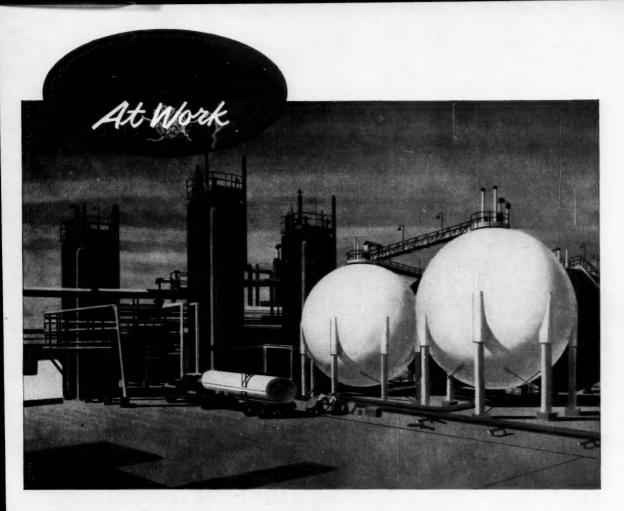
Retroactive to July 1 is the just-posted price cut on ethylbenzene. Koppers, which announced the reduction, brings its tank-car schedule down $1\frac{1}{2} \frac{e}{l}$ (to $12\frac{e}{l}$), and car-load and truck-load quantities down $2\frac{e}{l}$ lb.

In addition, the company is hiking drum differentials over tank-car lots $\frac{1}{2} \phi/\text{lb.}$ in c.l. and t.l. quantities, and $1 \phi/\text{lb.}$, l.c.l. Reason: "increased drum and packaging costs."

SELECTED PRICE CHANGES-Week Ending July 22, 1957

DOWN		
	Change	New Price
Ethylbenzene, 99%, tanks, frt. equald.	\$0.025	\$0.125
Molasses, blackstrap, feed grade, tanks, New Orleans, per gal.	0.005	0.185
Stannous chloride, hydrous crystals, dms., wks	0.00375	0.8425
Tin metal (Straits)	0.0025	0.9650

All prices per pound unless quantity is stated.



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In the highly competitive anhydrous ammonia industry, peak production efficiency and uniform product quality receive top engineering priority. That's why many of the nation's NH₃ plants employ guard chambers of Pittsburgh Type BPL Granular Carbon to remove sulphur compounds from their natural gas or hydrogen streams.

Because of its extremely efficient vapor phase adsorption properties, Pittsburgh BPL Carbon is at work in the guard chambers of 70% of the anhydrous ammonia plants designed or built by Chemical Construction Corporation, New York, N. Y. CHEMICO plants produced 1,554,000 tons—or nearly one-third of the nation's NH₃ output—in 1956.

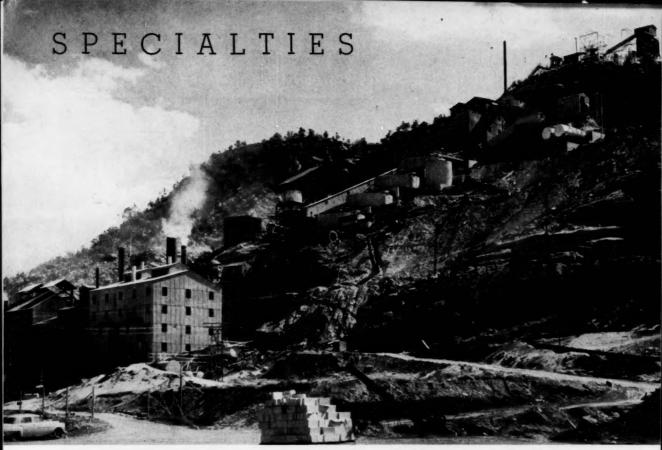
What's your adsorption problem? Purifica-

tion? Decolorization? Catalysis? Pittsburgh Granular Carbons have set an outstanding record of performance in these and many other adsorption processes. We'd be glad to forward you more information on applications in *your* field. Write or call today!



WSW 6707

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Uranium ore processing plants like the one above are biggest users of synthetic flocculants

Uranium: Spur For Synthetic Flocculants

high-molecular-weight synthetic flocculating agent now being introduced by American Cyanamid brings a rugged newcomer to a market area that has blossomed almost overnight. Although they possess only a small segment of the total flocculating market, the synthetics nevertheless are industrial specialties with sales of well over \$3 million/year. This growth, registered over the past three years, is due mainly to the major scaleup in the refining of uranium ore.

Currently dominating the uraniumore processing market is Dow Chemical with its Separan 2610, a highmolecular-weight polyacrylamide, introduced in 1954. But Cyanamid's new item, Reagent S-3171 (to be called Aerofloc 570) is a similarly high-molecular-weight product that stands a far better chance than Cyanamid's earlier Aerofloc 3000 of matching the success of Separan 2610.

At a premium price of \$1.15/lb.about 10 times higher than old standby products, synthetics are plainly

for specialized uses. But these products in many cases are the only ones that will do the job on uranium ore and that outweighs cost considerations. About 80-85% of the synthetics now are consumed in uranium.

Eleven more U.S. uranium refining plants are due to be in operation in '58, almost doubling the number now working. Currently some 9,210 tons a day* of uranium ore are processed in the existing 12 plants, and each ton requires anywhere from 0.2-1.0 lbs. of flocculant. Average: between 1/4 to 1/2

At the 1/2-pound figure this means the potential daily market for flocculating agents is in the neighborhood

of \$5,300,† around \$2.3 million/year. Add in the nonuranium uses and the

*Other markets: Coal mining and sugar refining, paper processing, oil production, gold and silver cyanadation, nickel recovery and plating, cement making.

This figure is possibly slightly high for this purpose, since it includes the output at the government-owned plant in Monticello, Utah, (600 tons/day) and the Uranium Reduction Co. plant at Moab, Utah (1,500 tons/day). These are resin-in-pulp producers, use very little flocculant.

figure comes to around \$3 million. Dow's dominance in this market is underscored by industry estimates that the company is now selling about \$2 million worth of the synthetics a

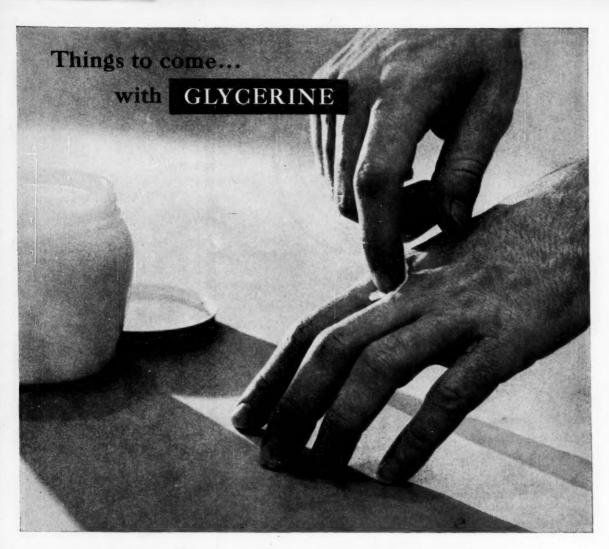
If the picture looks good in the U. S., it looks even better in Canada. In the next few years, when now abuilding plants are in operation, some 45,000 tons of uranium will be processed daily-five times the present U. S. output.

More Synthetics: Though Dow and Cyanamid both have been long-time suppliers to the mining industry, they are far from being alone.

• National Aluminate (Chicago) has its Nalco 600, a cationic polyelectrolyte. It is used in general water treatment as well as uranium ore refining, sells for about 25¢/pound, is used at a 1-ppm.-rate.

· Monsanto has Lytron (a hydrolyzed polycrylonitrile), and a newer product, DX 908.

· Goodrich has Good-Rite, a syn-



New skin fungicide with self-regulating action

A new fungicide* for skin infections, with Glycerine Triacetate as the active ingredient, duplicates on a small scale a completely self-regulating chemical process.

The fungicide works this way: Esterase, an enzyme present in skin, serum and in many fungi, hydrolyzes the triglyceride to glycerine and acetic acid—the chemical which actually inhibits the fungi. Accumulation of the acid, however, causes the pH to drop to a level which decreases esterase activity. This in turn slows up production of the acetic acid, keeping it well within physiological tolerance. As the acid is neutralized, the pH rises and the cycle starts again.

The new fungicide is expected to be marketed soon. Meanwhile, other triglycerides are under investigation as new chemotherapeutic agents.

Glycerine's usefulness continues to grow. Stable in price, dependable in supply, Glycerine offers processors a unique balance of properties: It is hygroscopic, nontoxic, stable, nonvolatile, with excellent solvent power and agreeable taste. New applications for Glycerine are extending its use in paints, foods, pharmaceuticals, packaging and many other fields. For a useful 20-page booklet, "Glycerine Properties and Uses," write to:

*Developed by Dr. S. G. Knight, University of Wisconsin

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Excerpts
From
The Chemical
Hall of FAME



Victor Grignard

(1871-1935)

Received the Nobel prize in 1912 for his development of the *Grignard reaction* which was of considerable importance in synthetic organic chemistry.

By 1912 Foremost's El Dorado Division already had more than 20 years' experience supplying coconut oil and its by-products of the finest purity and consistent uniformity.



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Myristate Caproate

°T.M. Reg.

For Example: ELDO LAURIC ACID

96-99% pure. (Purest Lauric Acid commercially produced.) Readily available at an attractive price. Eldo's high standards give you a better, more uniform end product.



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In New York: H. Reisman Corp.

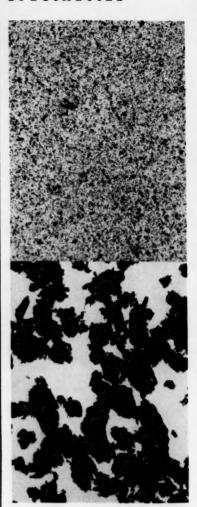
In Chicago: M. B. Sweet Co. In Detroit: Harry Holland & Son, Inc.

> In Cincinnati: Howard Dock

In Boston: N. S. Wilson & So

In Cleveland: F. W. Kamin Co.

SPECIALTIES



FEWER SMALL PROBLEMS: Photomicrographs (75x) show formation

thetic-resin flocculant, since 1955. But since it's not effective under acidic conditions, it has not been much of a threat in uranium-processing.

• Rohm and Haas's experimental DF-381 showed a lot of promise for flocculation, but a CW check with R & H reveals that it is no longer pushing the product for that use.

New Competition: In the synthetics, the next big name will probably be Union Carbide. A major processor of uranium, through Union Carbide Nuclear Co., the company is said to have a flocculant due to hit the market late this year.

Some tough competition for the uranium flocculation business is also bound to come from the new natural products developed for that use. Such products as locust bean, cactus juice

Do You Buy Desiccants?

Reynolds Activated Aluminas are low in cost, have high capacity, are inert to most chemicals

Reynolds Activated Aluminas have no written formula. They are mixtures of various forms of Al_2O_3 and H_2O . Their component water contents vary from 0% in aluminum oxide to 34.6% in trihydrated aluminum oxide.

In-between compounds are formed under carefully controlled conditions to generate crystalline arrangements with maximum surface area to take advantage of the direct relationship of high surface area to degree of adsorption. The following table indicates the high adsorptive capacity of activated aluminas.

Two grades of activated alumina are available at present. The two grades are identical chemically, but differ only slightly in their capacity to adsorb moisture.

TYPICAL CHEMICAL PROPERTIES OF GRADES R-2101 AND R-2102 ACTIVATED ALUMINA

(Analyses in Percent on Dry Basis)

Al ₂ O a	Na ₂ O	SiO :	Fe ₂ O a	TiO:	Combined H ₂ O
91.5	0.75	0.10	0.02	0.002	7.0

TYPICAL DYNAMIC ADSORPTIVE CAPACITY (Capacity in Percent on Dry Basis)

Grade	At 10% Reta tive Humidity	At 20% Relative Humidity	At 40% Relative Humidity	At 60% Relative Humidity	At 80% Relative Hum. dity
R-2101	3.6	5.1	7.6	12.0	16.0
R-2102	3.3	4.8	7.0	11.0	15.0

SPECIFICATIONS FOR SHIPMENT (Analyses in Percent on Dry Basis)

	Grade	A 203 (Mis.)	Na ₂ O (Max.)	SiO ₂ (Max.)	Fe ₂ O ₃ (Max.)	TiO ₂ (Max.)	bi ned	At 10% Relative Humidity	Relative
1	R-2101	90	0.80	0.12	0.10	0.02	9.0	3.3	15.0
1	R-2102	90	0.80	0.12	0.10	0.02	9.0	3.0	13.0

PARTICLE SIZE

Activated Alumina is offered in the following three standard particle sizes:

(1) Thru ½" on ¼" (2) Thru ¼" on 8 mesh

(3) Thru 8 mesh on 14 mesh

The advantages of activated aluminas as a desiccant include their low initial cost, their high capacity (see table above), and the fact that they are inert compounds in the presence of most chemicals. They may be used in contact with other chemicals without affecting them or the function of the activated aluminas themselves.

A major economy in the use of activated aluminas as desiccants stem from easy reactivation. Heating for a few hours at 175 to 200° C accomplishes complete reactivation. Activated aluminas in commercial use are usually placed in twin units with built-in heating elements. Thus one unit is in service while the second is being reactivated. In such a system plant operation can be continuous.

The wide variety of activated aluminas applications can best be described with a listing of its uses:

- they dry gases: air, nitrogen, hydrogen, oxygen, carbon dioxide, chlorine (some reaction), sulphur dioxide (slight decomposition of alumina), freon, ethylene, butane, by-product coke gas and natural gas.
- they dry liquids: pyridine, ethyl acetate, gasoline, coal tar derivatives, benzol, toluol, methyl alcohol, vegetable and animal oils, melted waxes, carbon tetrachloride.
- they are used to keep air lines free of water, to keep oil and gas lines dry.
- they provide dry air for transformer breather systems.
- they have an affinity for fluorine, highly effective in water defluoridization, and in HF alkylation.
- they are effective filtering media for turbine oils.
- they are used as catalyst carriers in petroleum refining.

Government Specifications: R-2101 Activated Alumina meets the rigorous requirements of joint Army-Navy Specification 169-D, later superseded by the military specification MIL-D-3716. Adsorptive capacity defined for Reynolds Activated Alumina is determined in accordance with methods prescribed by the above mentioned specification.

Shipping: Reynolds Activated Aluminas are offered in 100 pound lined burlap bags, in foil lined bags, in 400 pound steel drums, and in fiber drums. Minimum shipping quantity is 100 pounds. They are available in various particle size ranges.

Complete research and engineering services are available from Reynolds Metals Company to assist you in solving chemical, material or shipping problems. Samples and data sheets are available on Alumina Hydrates, Calcined Aluminas, Aluminum Dross and Aluminum Powders. Consult the Reynolds Office nearest you, or write direct to Reynolds Metals Company, P.O. Box 1800-CM, Louisville 1, Ky.

See "Circus Boy", Reynolds exciting dramatic series, Sundays, NBC-TV



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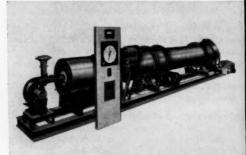
Neutralizing objectionable odors in rubber is a job for experts...and we are pioneers in this field. Our PARADORS are designed to solve your rubber odor problems effectively, economically. They are stable under all processing conditions, compatible with all types of rubber ingredients, will not affect the properties of your

finished product...and are suitable for plastic application as well. Their concentrations can be controlled to give exactly the right odor reduction or add a pleasant scent if desired.

May we send you samples of Paradors and put our experience to work for you?



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ROTARY DRYERS Steam Tube, Hot Air and Direct Fire

Atmospheric DRUM DRYERS

ROTARY COOLERS Water and Air

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The above photograph shows a 2'-3" x 16'-0" DAVEN-PORT Rotary Flash Dryer for drying asbestos. This is a package unit fired with natural gas, with complete automatic controls. Furnace output 1,250,000 B.T.U.

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DAVENPORT MACHINE AND

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Davenport, Iowa, U.S.A.

SPECIALTIES

and guar gum actually antedate the synthetics, and back in '53 it looked as if they would be the standard items for ore settling and filtration.

Among those pushing the natural products are General Mills (Guartec), Stein Hall (Jaguar) and Burton Co. (Burtonite).

An important advantage these natural products have over the synthetics is low cost. Guartec costs about 32-40 \$\phi/\text{pound}\$, and in many applications, only a very small fraction of a pound is used per ton of ore solids.

Also working in favor of Guartec and like products— and sure to be a factor in the search for new markets such as water treatment—is its innocuous character. The question of toxicity of the synthetics is still not settled. The hazard arises from unpolymerized acrylamide monomer.

Trial and Error: Uranium processing involves some of the toughest liquid-solids separations in industry, and, more often than not, it's a case of trial and error finding which floculants work best. And this usually must be determined in process full-scaling—laboratory testing is not always reliable.

Despite the sales efforts of the various flocculant makers, in the long run they don't really have much to say about what product will go into the ore treatment—the best they can do is hope their products fit the particular needs at hand. Expanding markets for flocculants, however, are sure to keep manufacturers on the trail of new products. The reward for good ones is substantial.

Seagoing Band Aid

A plastic-impregnated cloth, elastic enough to expand and shrink with wooden planks is the latest thing for boat repairs. The new marine cloth, which bonds permanently to wood, metal and plastics, is manufactured by Davis Buckram Ltd. (Beacon, N. Y.) and is tradenamed Hercules.

Before applying the cloth, old paint must be removed from the boat body. The cloth is then spread with primer, immersed briefly in a solvent, and pressed on the area to be repaired. Once it has been applied, the cloth is not affected by water, salt, fungus, or temperature variations. It can be painted with regular hull or deck enamel, without any special prepainting treatment.

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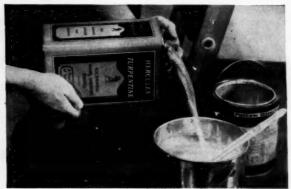


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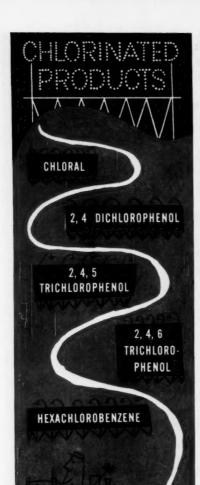
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Diamond Chemicals

SPECIALTIES

Push on Poison Control

The University of Arizona (Tucson) last month became the latest group to establish a poison-control center—a centralized service offering emergency help in cases where poisons have been misused.

The Tucson center, financed with donations and the budget of the university's college of pharmacy, is just one of 19-20 new centers starting or set to start across the country. The total number of such groups has now reached 96, nearly ten times the number established when CW last looked at poison-control centers only two years ago (CW, July 16, '55, p. 54).

Although roughly one-fourth of the centers have been set up by state governments, the majority of them are operated wholly within local communities—usually by a group of doctors and hospitals. The purpose is to get together a file of ingredients and antidotes for every conceivable poison or possible poison, a broad definition that includes most chemical specialties.

Lower the Count: Last year, according to the National Safety Council, some 1,300 men, women and children died from accidental use of household chemicals. In Arizona, for example, children of migratory laborers are often poisoned by drinking kerosene, which is widely used in the workers' camps for light and fuel.

It's hoped that with detailed product and antidote information on file (kept rigidly confidential), the centers can advise physicians of proper treatment—in time to lower this toll of lives.

The value to specialties makers is obvious: without having to make formulas public, the specialties maker is virtually able to eliminate—in areas where centers are located—much of the possible hazard from misuse of his product.

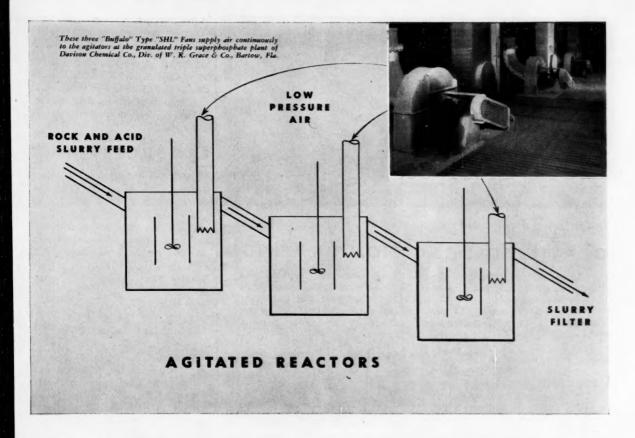
The idea is gaining strength. This month, in Washington, a federal office has been set up to facilitate the work of the local poison-control centers. The National Clearing House for Poison Control Centers has just been set up under Dr. Howard Cann of the



Putting Wings on Farm Chemicals

The strange looking aircraft above—tabbed the PL-7—was especially developed for Australian agriculture. Capable of carrying a ton of fertilizer, insecticide, herbicide, or plant seeds, it will play a key part in Australia's efforts to develop great areas of rough but potentially valuable land. Aerial application of

agricultural chemicals has proved a booming market "down under," may grow even more. Last year, 500,000 acres were topdressed with superphosphates by aircraft, another half-million acres treated with herbicide or insecticide. Now, target for airapplied herbicide is 14 million acres of scrub-covered land in Queensland.



REACTION TEMPERATURE controlled by low pressure air -

-in production of granulated triple superphosphate

At one stage in the production of this highly concentrated phosphate fertilizer, phosphate rock and sulfuric acid react together in a series of pre-mixer and agitator tanks. The reaction is exothermic, and must be maintained at the optimum temperature of 70° to 75° C.

This important temperature control is dependably held by large volumes of low-pressure air from the "Buffalo" Fans, blown continuously thru the slurry in the three agitator tanks — via special distributor pipes, forming bubbles which carry away the excess heat as evaporated water. Just one more place where a modern chemical plant relies on "Buffalo" for punishing air jobs, as industry has been doing for the past 80 years.

"BUFFALO" FANS FOR CHEMICAL SERVICE include efficient central-system ventilating fans, industrial exhausters, rubber-lined and resin-bonded fiber glass fans for corrosive fumes — all built to the high standards of the "Q" Factor*. Write for recommendations on your air handling or air cleaning problem. There's a modern "Buffalo" unit to solve it to satisfaction.

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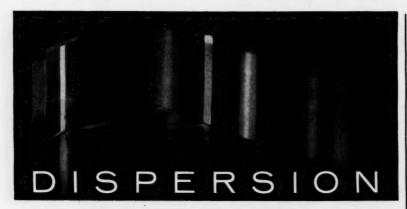
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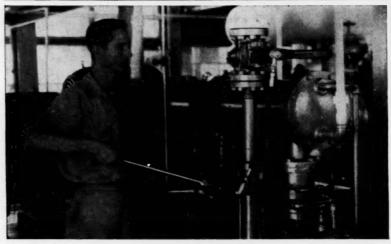
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Valve failure is often hazardous . . . always costly. To cut down time and service costs, more and more process engineers are specifying Rockwell-Nordstrom lubricated plug valves to replace inefficient valves. Their reasons: pressurized lubricant sealing prevents leakage, assures positive shut-off; seats are fully protected from corrosive line material; and

lubricant eliminates metal-to-metal wearing friction for longer life at lower cost. Yet Rockwell-Nordstrom valves cost no more to buy, often less, than ordinary valves. They are available in standard end-to-end dimensions for fast, easy replacement installation. Write for complete details:

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SPECIALTIES

U.S. Public Health Service's accident, prevention group. This agency, as its name implies, will facilitate the exchange of information on how to deal with hazards of various chemical specialties, as well as other poisonous materials.

PRODUCTS

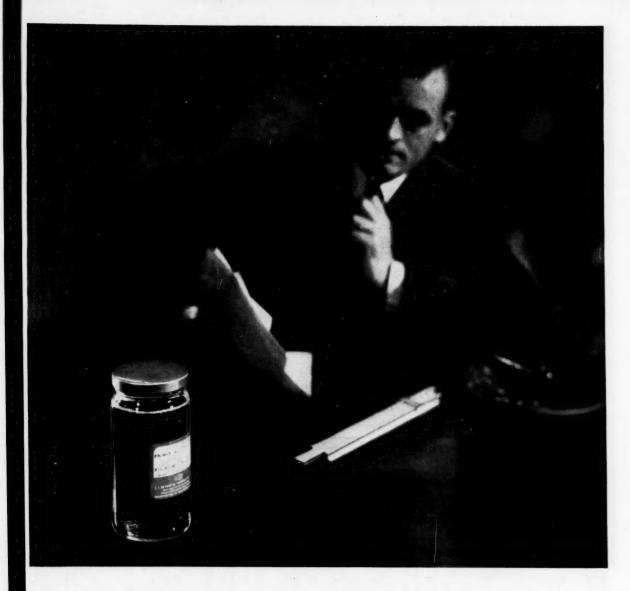
Quick Shine: According to Butcher Polish Co. (Malden, Mass.), its new silicone furniture polish, Beau, can be applied rapidly, doesn't have the unpleasant "cleaning fluid" odor associated with silicone polishes. The polish consists of imported wax dispersed in a suspension of Union Carbide's dimethyl silicone oil and other liquids. A 6-oz. bottle retails at \$1; a 12-oz. bottle at \$1.75.

Germ Pool: Quick to get into what looks like an expanding market, Nutheme Co. (Chicago) has brought out a germicide for swimming and wading pools. Containing 16% Chloramine T, Nutheme's Sani-Swim is said to afford "all-day" protection against the spreading of coldlike respiratory infections. A 5½-oz. jar of the germicide—said to be enough for 4,000 gal. of water—costs \$1.49.

Looking Up: Agfa Filmfabrik (Wolfen, East Germany) has brought out an improved infrared film for astrophysical photos. The film pack, which is called Agfa-H-Alpha, is said to reduce the time of exposure to one-eighth that usually required for sun corona photos.

Protective Coating: Oncrete Germ-Rid, a new paint for concrete, contains a germicide designed not only to protect children playing on floors but to protect adults against athlete's foot as well. The company claims that the germicide (copper - 8 - quinolinolate) will remain effective as long as the paint remains intact. It sells at \$3.50/qt., is made by Oncrete Products, Inc. (Chicago).

Sales in Sight: Two novel products for automobile windows and windshields have just been put on the market. One, a product made by Garry Laboratories (Buffalo, N. Y.), is a spray for stopping the squeaking and binding of auto windows. The maker claims that when the material is



Somewhere there's a chemist who will find what this unusual surfactant was made for

This researcher isn't going to turn flip-flops about Du Pont offering him a new chemical-Product BCO.

"But, what is there," he'll ask himself, "about this surfactant from Du Pont that makes it so unusual?"

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SPECIALTIES

sprayed on rubber molding on auto trunks and doors, it helps to prevent deterioration.

• Rubber Magic, Inc. (Brooklyn, N.Y.), has a product called Wind-Shield for sealing and waterproofing leaky windshields. A 2-oz. bottle retails for \$1.

Rubber Road Rights: The Goodyear Tire & Rubber Co. (Akron, O.) has renewed its interest in Ruberite, a rubber-mineral powder used as an asphalt additive and in certain other industrial applications, by purchasing patents and trademarks of Ruberite Inc. The firm, once owned by Goodyear in partnership with two other companies, has more recently been owned by the National Lead Co.

In the Red: The Pigment, Color and Chemical Division of Sherwin-Williams has developed a new color, Polaris Red CP-1285, for use in the printing ink, plastics, and rubber industries. The bright, bluish red is said to have improved light resistance (compared to other nonbleeding azo reds), to be lower in cost, and to have good tinting strength.

Speed Up: A new secondary accelerator, for both synthetic and natural rubber formulations, when used with GR-S, is said to produce a tread stock with a wide curing range. It is also claimed to improve the tread's resistance to cracking under repeated flexing, yield vulcanized GR-S products with better "cut-growth resistance" but no higher heat buildup under repeated flexing. The product, called Bunac D-74 Rubber Activator, is made by Industrial Chemicals Division of Olin Mathieson Chemical Corp.

Concentrated Cleaning: Surfacto 56 is a recently marketed, low-cost synthetic cleaning concentrate for floors. Made by Surfacto Co., Inc. (Blue Island, Ill.), 56 is a clear, viscous, amber concentrate which has a bland odor, will not bleed colors.

Bright Future: Niphos, a nickel-alloy coating—not a plating—has been developed to protect ferrous metal parts from corrosion and abrasion. The coating can be painted, sprayed, or dipped onto any size or shape of part, after which it is fused into a nickel alloy surfacing by heating the

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The mighty BIG N, built for Mid-South Chemical Company of Memphis at INGALLS' Pascagoula, Mississippi yard, is symbolic of INGALLS' ability to "tailor" shallow draft river equipment for specific duty. The N carries 920 tons of anhydrous ammonia — a liquid fertilizer rich in soil-building NITROGEN — in tanks engineered for pressures of 250 lbs. per square inch. Special air operated valves insure complete safety. Its piping arrangement speeds cargo loading and discharge and INGALLS' famed patented bow reduces trip time, increasing profit! If your barge requirements call for a practical application of skill and economy in an unusual design or one already known, take your job to INGALLS. Write for literature today.

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POSITION OPEN

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Att. Joseph Darvin.

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SPECIALTIES

object in a reducing atmosphere. The coating's maker — Tube Reducing Corp. (Wallington, N.J.)-says the coating forms an interface much like a brazing alloy.

Fast Blue: Geigy Chemical Corp. (Ardsley, N.Y.) has a new blue dyestuff for cotton and viscose rayon. The dyestuff, called Cuprophenyl Blue 3GL, is said to be fast to light washing and perspiration when aftertreated with copper sulfate and acetic

Copy Wax: A new grade microcrystalline wax, designed especially for makers of typewriter carbon paper, has been developed by the Bareco Wax Co. (Tulsa, Okla.). The new wax -called WB-5-can be used as a complete replacement for carnauba or ouricuri wax, according to its maker. Also claimed for WB-5: good retention of oil, dependable solvency for dyes, excellent flow during manufacture, uniformity of product, and stability of price.

Tenderizer: Dodge & Olcott, Inc. (New York), has come up with a novel seasoned tenderizer for seafood processors. Designed to be used either prior to quick freezing or to cooking, the new product is a blend of spice essential oils and a tenderizing solution, with a little sodium benzoate added. The product is called Spiso-

New Dye: Imperial Chemical has developed a new dye that imparts brilliant bluish-red shades to cellulosic fibers and nylon. Fastness properties are similiar to those of ICI's Procion Brilliant Red 2 B. The new product is called Brilliant Red 5 B.

Wire Item: A new silicone rubber compound, SE-975, specifically designed and manufactured for wire insulation, is now being offered by the Silicone Products Dept. of General Electric (Waterford, N.Y.). Physical properties after a cure of one hour at 300 F include 1150 psi. tensile strength, 425% elongation and 125 psi. tear strength.

Plant Hormone: Velsicol Chemical Corp. (Chicago) has added gibberellin to its list. Velsicol will sell the plantgrowth stimulator to formulators for conversion into packaged products.

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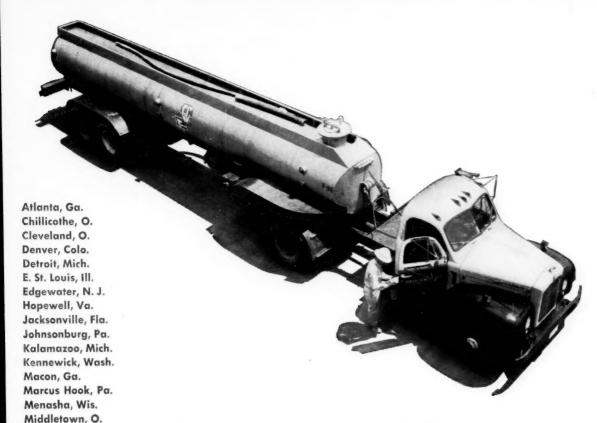
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